The invariable dependability of Tretolite is the most important factor in the continued success of Tretolite. This dependability is due to other qualities—accuracy, efficiency, and economy. The combination of these factors insures complete satisfaction whenever Tretolite is used in the treatment of crude oil to pipe line requirements.

TRETOLITE COMPANY

Manufacturing Chemists

DALLAS **ST. LOUIS** LOS ANGELES

Representatives in All Principal Fields

TRETOLITE

CEMENTS FOR OIL INDUSTRY SERVICE

—BACKED BY

CONTINUING RESEARCH

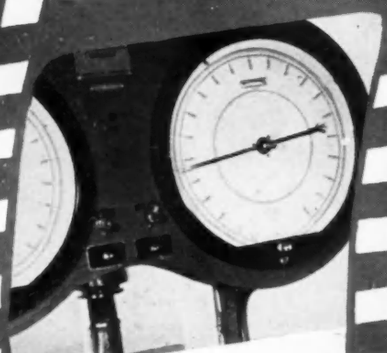
IN THE

FIELD AND LABORATORY

RIGHT AT THE RIG, Lone Star's oil-field service organization studies cementing problems—to keep the men at the mill constantly informed on oil-field requirements.

TESTS FOR NEEDED PROPERTIES and qualities—such as length and ease of pumpability at high temperatures—are part of daily routine.

NEAT-CEMENT TEST SPECIMENS are cured at 140, 170 and 200° F., to approximate the various conditions encountered in oil-well service—



AND STRENGTH, SO ESSENTIAL in oil-well cementing, is constantly checked. Work like this goes on all the time—we call it "keeping pace with progress."

Day in and day out, Lone Star's oil-field organization studies cementing problems right at the rig, to keep an accurate line on the Oil Man's requirements. Close contact with problems in the field enables us to make cements with the properties and qualities needed to meet changing conditions of oil-industry service.

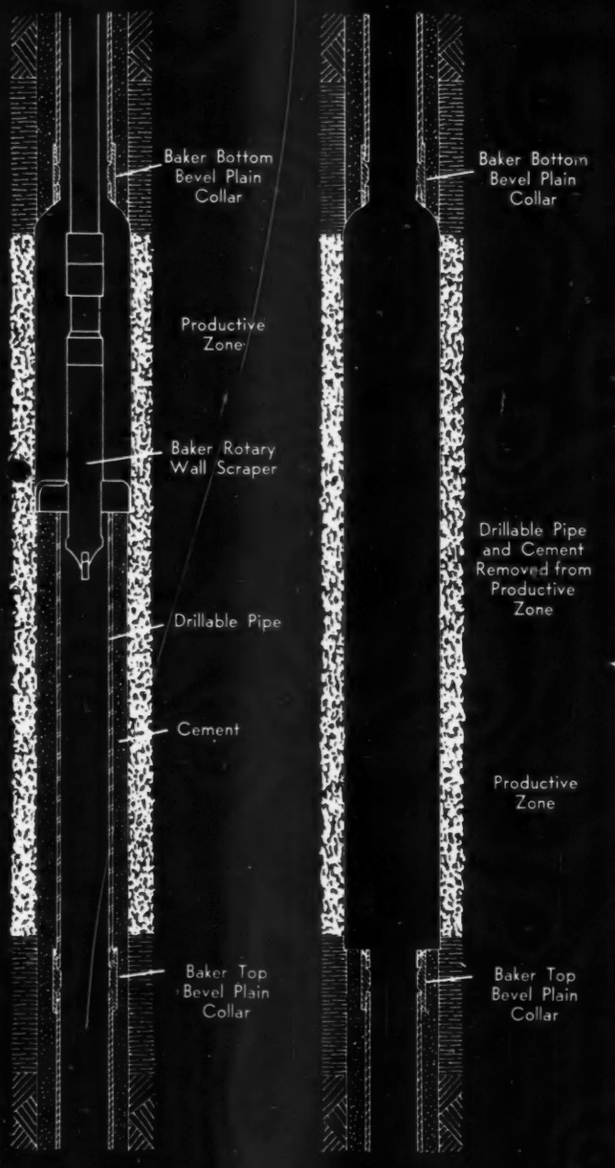
That is why 'Starcor' and 'Incor' deserve to be called the Oil Man's Cements—because they are made to measure for today's oil-industry needs. Use 'Starcor' for deep wells, greater length and ease of pumpability at high temperatures. Use 'Incor' for wells of moderate depth—earlier drill-out, wells on production quicker. Insist on 'Starcor'* or 'Incor'*—it'll pay you well. *Reg. U. S. Pat. Off.

LONE STAR
CEMENT CORPORATION

DALLAS: Santa Fe Building . . . . HOUSTON: Shell Building

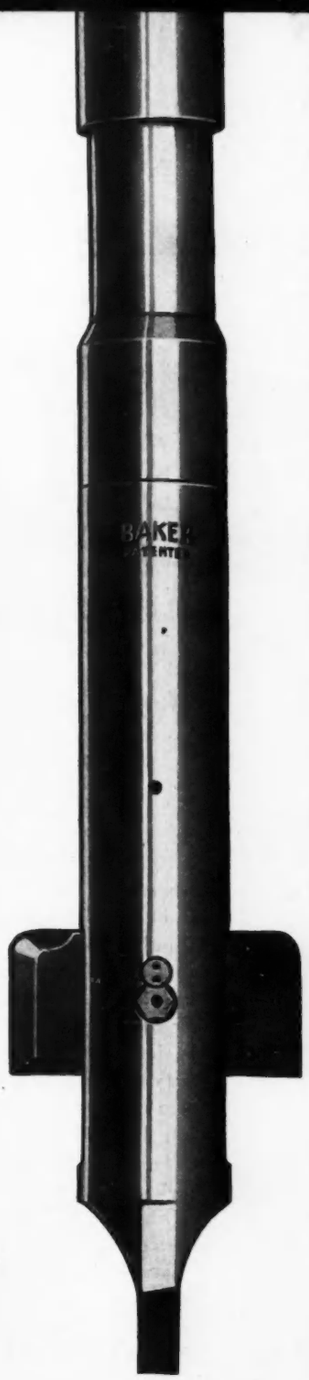
REMOVING SECTIONS OF DRILLABLE PIPE

One of 12 Practical Field Applications For The BAKER ROTARY WALL SCRAPER



The Baker Rotary Wall Scraper effectively removes both the section of drillable pipe and the cement behind the pipe. The hole is enlarged slightly to clean the face of the oil zone.

The cemented drillable pipe through the productive zone has been removed and the well is ready to be completed in this zone. The face of the formation has been scraped clean.



See pages 252-258 of the Baker Section of the 1940 Composite Catalog

Send for Baker Broadcast No. 19

BAKER ROTARY WALL SCRAPER

BAKER OIL TOOLS, INC.
P. O. Box 127, Vernon Station
LOS ANGELES, CALIFORNIA
HOUSTON, TEXAS
NEW YORK, N. Y.

The BAKER ROTARY WALL SCRAPER...

is a simply constructed, versatile tool that Safely and Economically performs a number of important field applications. While designed primarily to enlarge the walls of an open hole, it has proved extremely efficient for several other types of applications . . . one being the removal of sections of drillable pipe such as shown in the accompanying illustration.

TWO TOOLS IN ONE

Another application for the Wall Scraper that does not come within the scope of "hole enlarging" is that by substituting special Sampler Blades for the regular Scraper Blades, converts the Wall Scraper into a Wall Sampler. This efficient device will take actual cores from the side walls of any uncased hole. Here is a "TWO TOOLS IN ONE" feature that means DOUBLE VALUE for your money.

Safety and Service

The Safety and Efficiency of the Baker Wall Scraper has been ably demonstrated in thousands of successful runs made in oil fields throughout the world . . . under varied adverse operating conditions . . . and yet to our knowledge, this tool has never failed to come safely out of the hole with hole in condition for further operations.

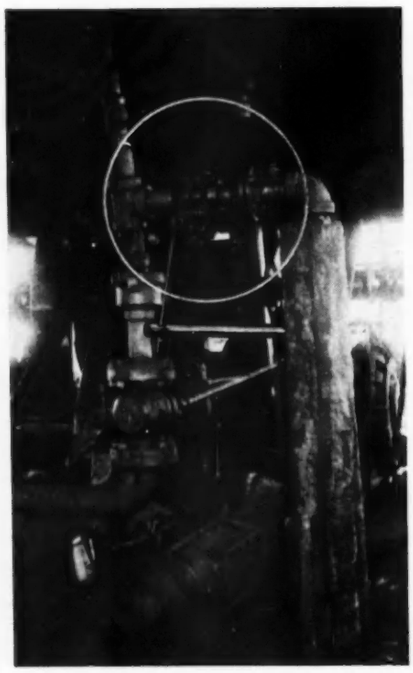
Important Applications

Enlarging Holes for Casing
Cleaning Up Oil Sands
Setting Liners
Setting Cement Plugs
Bottlenecking for Cement Jobs
Removing Sections of Drillable Pipe
Water Shut-Off Tests
Sidetracking
Straightening Holes
Fishing Jobs
Enlarging Holes for Gravel Packing
Side Wall Sampling (by converting Scraper into Baker Wall Sampler)

Everlasting Valves meet an

EMERGENCY

with a Lebanon CIRCLE L *Steel Casting*



Lebanon made the castings for this Everlasting Emergency Throttle Shut-Off Valve at a Shell Company oil well, Roanoke, Louisiana.

PROTECTING lives and equipment in the drilling fields is the job of Everlasting Emergency Throttle Shut-Off Valves. Drilling men themselves realized that there were times when the instant shutting off of steam to the engines by the driller was an essential safety precaution. The Everlasting Valve illustrated is made especially for this service.

There are good reasons why Everlasting buy their steel castings at Lebanon. The proper analysis of steel is only the beginning. Structural integrity to stand up under high pressure steam service is equally important.

The reliability of Lebanon Steel Castings is well recognized throughout the oil industry. A Circle L on the castings of your equipment is an assurance that these castings will stand up under the service for which they are intended.

LEBANON STEEL FOUNDRY • LEBANON, PA.

Original American Licensee George Fischer (Swiss Chamotte) Method

Lebanon STAINLESS AND SPECIAL ALLOY Steel Castings

Looking Ahead
WITH THE EDITOR

THE NEW ANTI-TRUST SUIT filed against 22 oil companies and the American Petroleum Institute last week has been rumored for many months. For some reason or other it was held up until now, which happens to be a very choice time from a political standpoint. Could that have been the reason? Perhaps so and perhaps not, but the statement by Attorney General Robert Jackson explaining the suit certainly smacked of "vote getting." For instance, consider his statement that if successfully prosecuted the suit would result in independent producers receiving higher prices for their crude oil and consumers of gasoline, fuel oils, kerosene and lubricants would be able to buy these petroleum products at lower prices.

The industry will be hearing a lot about this new trust suit, for it is the most important of the current prosecutions against oil, and involves several new angles. THE OIL WEEKLY will bring to its readers full information on the developments.

ELECTRICAL LOGGING has become a very important oil field operation, and is being depended upon more and more. As its applications grow, new questions that puzzle many operators are arising.

Next week, THE OIL WEEKLY will begin publication of a series of practical articles on electrical logging studies. Much material has been published in the past on electrical logging, but most of it has been of a highly technical nature. This new series is written especially for the oil man without technical training or wide experience in the interpretation of electric logs. Many of the questions that puzzle such men will be answered in this series, written by Leonard J. Neuman, consulting engineer, and Ralph B. Cantrell, Lane-Wells Company.

The OIL WEEKLY, Published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

BAASH-ROSS 2RH (Hexagonal) Roller Kelly Drive Bushing

Today's Preference for All Drilling Conditions

BAASH-ROSS

HEXAGONAL KELLYS *and* 2RH *Roller* KELLY DRIVE BUSHINGS

Because...

The BAASH-ROSS Hexagonal Kelly and 2RH (Hexagonal) *Roller* Kelly Drive Bushing combined produce a positive drive with smooth, frictionless kelly feed under all torsional loads and rotational speeds.

Because...

BAASH-ROSS Hexagonal Kellys have better balance at high rotation speeds. The driving surfaces are machined to close tolerances, the bore is true and concentric, and the joints are accurately aligned.

Plus...

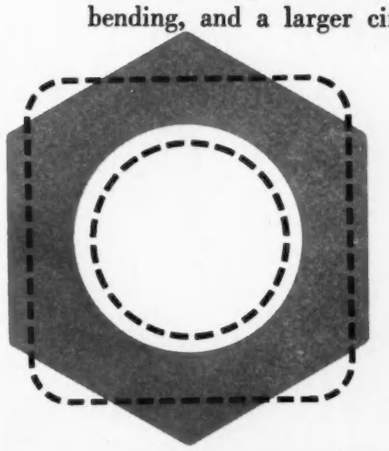
Greater strength in torsion and tension, greater resistance to bending, and a larger circulation hole than in a square kelly of the same across-corner dimension.

Compare...

Here are the advantages of a 6⅝" hexagonal kelly with 4¼" bore over a 6" square kelly with 3½" bore, both made of the same steel.

- ⅛" more clearance
- 48% greater circulation area
- 1.8% stronger in tension
- 28.6% stronger in torque
- Slightly more resistant to bending across corners
- 23.2% more resistant to bending across flats.

In other comparable sizes hexagonal kellys present proportionate advantages.



And in addition, you are prepared to drill under pressure when necessary without changing the kelly.

Ask BAASH-ROSS how little it costs and how much it pays to use BAASH-ROSS Hexagonal Kellys and 2RH Roller Kelly Drive Bushings.

BAASH ROSS

TOOL COMPANY

OIL WELL TOOLS · SPECIALTIES

LOS ANGELES

HOUSTON · NEW YORK

Save Yourself

money . . . and pump trouble

Use the ORIGINAL COMPOSITION VALVE CUPS . . .

DARCOVA (Orange Label) the standard for more than 30 years under severe service at all depths.

DARVAL (Blue Label) for service in wells to approximately 2,000 feet in depth.

DARFLEX (Green Label) the popular favorite for wells to 800 feet in depth.

DARCOVA PUMCUPS FOR PUMPS

Manufactured only by

DARLING VALVE & MFG. CO.

WILLIAMSPORT, PA.

Letters to the Editor

Spacing and Profits

DEAR SIR:

The two articles, "Prorated Production at Minimum Profit Level" and "Industry Faces Economic Cross Roads," published in THE OIL WEEKLY July 29, contain some very timely information with respect to the present trend of the oil industry and suggestions as to how to offset such trends in the interest of increasing profits to oil producers.

A considerable part of one of the articles is devoted to a discussion of the trend of daily average allowable production per prorated well. The discussion of the curves in this section of the article, which illustrate graphically the decline of the per-well allowables for the period 1935 to 1940, is of particular interest in showing that there are constantly decreasing allowables to prorated wells, and that further reduction in such allowables will result in substantial losses to the average prorated wells drilled in the future because of the slow return of the investment. One important part of the article on "Industry Faces Economic Cross Roads" is a discussion of the various remedies that have been suggested for the lowered earnings, and these remedies are:

(1) Increase crude prices.
(2) Increase consumption, which will result in higher allowables.
(3) Reduce drilling and operating costs.
(4) Reduce capital and operating expenditures by curtailing drilling rates; adopt wider well spacing and unit operation of leases.

It is the conclusion of the author that the first three possible solutions mentioned above are either improbable or cannot be accomplished to any considerable extent that they would afford a remedy for increasing profits and, therefore, favors the fourth suggestion of reducing capital expenditures as the one most feasible, pointing out this may be done by wider well spacing and unit operation of leases. In this connection it is interesting to note that approximately two-thirds of all of the new wells started in the State of Kansas during the past year have been on 20-acre spacing. It has been estimated that 20-acre spacing in Kansas has saved approximately 700 wells during the past year. With an average well cost of $25,000 per fully equipped well, this would amount to a saving in capital expenditures of $17,500,000.

The analysis made by the authors of the two articles above mentioned bring out some very interesting points, and possibly the articles could be summed up by stating that they are written largely in the interest of wider well spacing with the resultant saving in capital expenditure, which, in turn, would yield greater profits to producers and is of special importance, particularly at this time when the returns are so small. The matter of wide spacing is not new to the I.T.I.O. Company as we have advocated this policy for the past several years, and it is encouraging to find that oil journals such as THE OIL WEEKLY have spent so much time and effort in accumulating and publishing information that helps to prove that this is the right policy for oil producers to follow.

In view of this, the authors of the two articles mentioned should be congratulated on their efforts, and it is suggested that follow-up articles be published from time to time so that the matter of wide well spacing may be more fully and better understood by the oil industry.

M. J. KIRWAN,
Chief Engineer
Indian Territory Illuminating Oil Company, Bartlesville, Okla.

Paraffin Removal

DEAR SIR:

In reference to article in August 19 issue regard to "Paraffin Removal" by F. R. Cozzens, I would like to ask if it would be advisable to treat a well as he suggested if the well is among a group that are on vacuum. We have found that when we cleaned out any of these wells it is hard to get enough water in to clean with as there seems to be a lot of vacuum even after the well is taken off the line and we presume the water is drawn back into the pay sands. We have in mind that the paraffin dislodged might be drawn back into the pay and cool off and seal there.

We would be glad to get this information as soon as possible as we would like to try the carbide treatment. For your information would state that the wells we operate are all in the Trenton formation and stripper wells.

ELLEN BURKE
Boundar Oil Corporation, Portland, Indiana.

To which Mr. Cozzens replies:

As I view it you have a complication which may seriously interfere with an effective carbide treatment. Since the beneficial results of carbide depend upon the presence of water, it would be largely guesswork to determine how much water to pour down the hole when vacuum draws it back into the pay sand. Since the agitation of the carbide and water would not be of sufficient duration to penetrate very far into the sand body, the best you could hope for would be a cleaning of the shot-hole or sand face.

I would make an experiment of one well, using the regular formula (100 pounds of carbide to 1 barrel of water) and note results. Since the agitation last but an hour or so, I do not believe you would lose enough water to greatly hamper results. I would let the well remain off the vacuum line as long as possible before using the treatment. I believe results would pay, even though the vacuum action in your sand would make the test more of an experiment than in wells not treated with suction.

These FEATURES mean ECONOMY

IN BETHLEHEM PUMPING UNITS

No unnecessary weight, but with strength to spare at highly stressed parts.

No welds at critically stressed sections.

High samson post and a wide clearance for well servicing.

Large diameter crankshafts.

Safety devices—even the belt guard designed for safe and easy removal of demountable rim on driver sheave.

True, built-in alignment of entire unit without use of shims.

Forged steel, heat treated gears as well as pinions.

Settling chambers in all sizes of gear boxes to trap foreign matter and water.

All bolts locked with double nuts.

Triple-locked counterweights on larger units easily removable and adapted to lag or lead.

Note these bearing details

All power transmitted to pitmans through straight and tapered roller bearings.
Bronze, sleeve-type saddle and tail bearings in fully machined mountings.
Large bearing areas throughout.
Double-cone, adjustable equalizer bearing.
Central lubrication.
Rubber mounted equalizer and pitmen on 5 and 7 H.P. units for shock and vibratory stress absorption.

Bulletins on Request

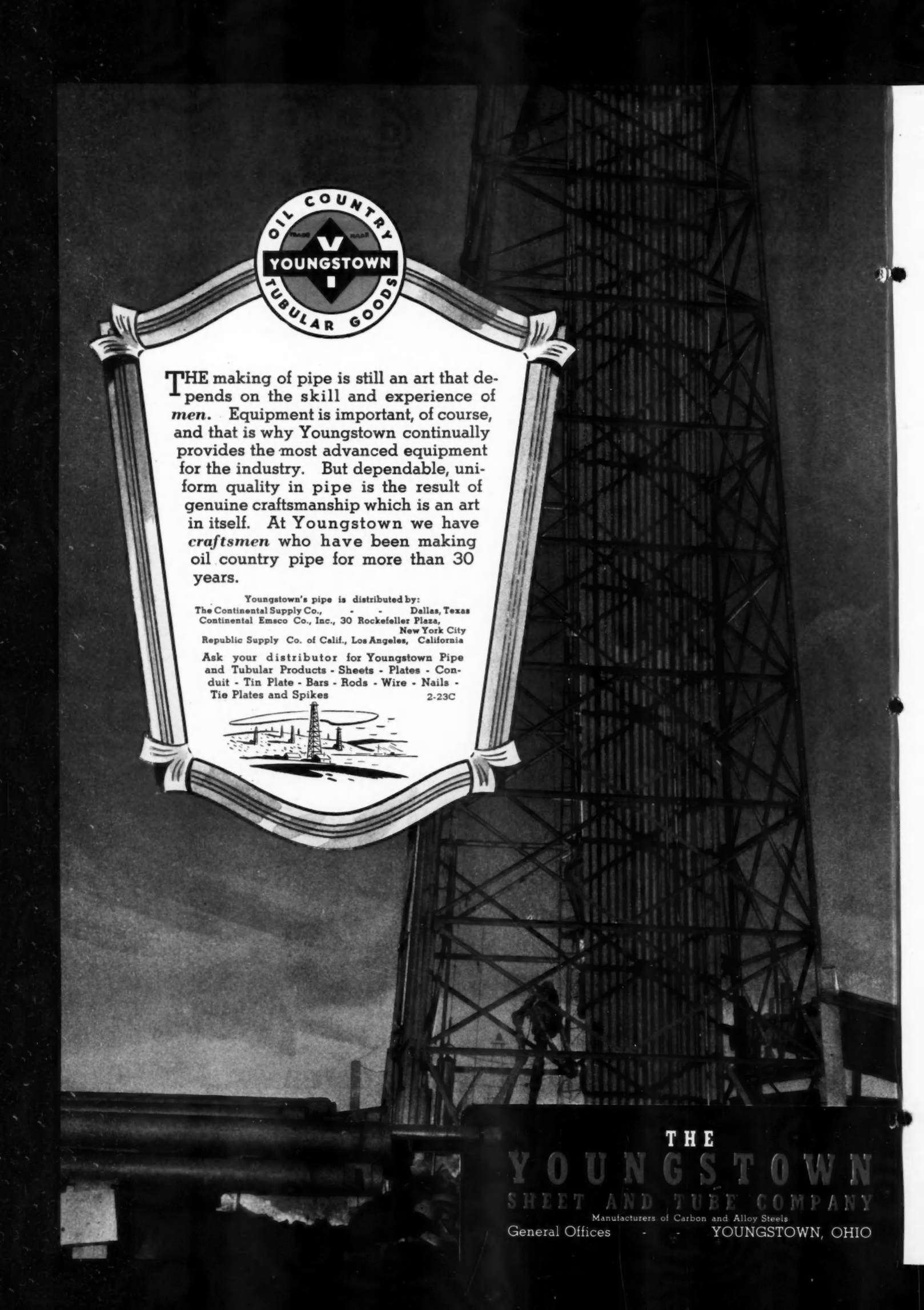
For more detailed information, write for one of the new bulletins on Bethlehem Pumping Units and learn why they are the choice of exacting operators. Bulletins are now available on the following types:

24-DT-5	51-DT-10	123-DT-14
36-DTA-7	51-DT-10RB	123-DT-14L

Here's one of the distinctive Bethlehem features—forged-steel, heat-treated gears and pinions. Both gears and pinions are special heat-treated Bethlehem steel, machined to accurate profile after heat treatment.

Call **BETHLEHEM SUPPLY COMPANY** for Service

Offices or Stores—*Illinois:* Grayville, Salem, St. Elmo; *Kansas:* Chase, Great Bend, Russell, Wichita; *Louisiana:* Houma, Lake Charles, New Iberia, Shreveport; *New Mexico:* Artesia, Hobbs; *Oklahoma:* Fittstown, Oklahoma City, Seminole, Tulsa, Wewoka; *Texas:* Alice, Avoca, Borger, Corpus Christi, Dallas, Frost, Ft. Worth, Houston, Kemp City, Kilgore, La Ward, Midland, Odessa, Pampa, Sominole, Wichita Falls.


OIL COUNTRY
YOUNGSTOWN
TUBULAR GOODS
THE making of pipe is still an art that depends on the skill and experience of *men*. Equipment is important, of course, and that is why Youngstown continually provides the most advanced equipment for the industry. But dependable, uniform quality in pipe is the result of genuine craftsmanship which is an art in itself. At Youngstown we have *craftsmen* who have been making oil country pipe for more than 30 years.
Youngstown's pipe is distributed by:
The Continental Supply Co., - - Dallas, Texas
Continental Emsco Co., Inc., 30 Rockefeller Plaza, New York City
Republic Supply Co. of Calif., Los Angeles, California
Ask your distributor for Youngstown Pipe and Tubular Products - Sheets - Plates - Conduit - Tin Plate - Bars - Rods - Wire - Nails - Tie Plates and Spikes
2-23C
THE
YOUNGSTOWN
SHEET AND TUBE COMPANY
Manufacturers of Carbon and Alloy Steels
General Offices - - YOUNGSTOWN, OHIO

THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

EDITORIAL STAFF
WARREN L. BAKER
Editor

J. KENT RIDLEY
Managing Editor

ASSOCIATE EDITORS
L. J. LOGAN — BRAD MILLS
WM. V. GROSS

DISTRICT EDITORS
B. F. LINZ.....Washington
BEN ALTMAN, FRANK TAYLOR.....Tulsa
H. H. KING.....Fort Worth
EARL S. POST.....San Antonio
R. W. BYRAM.....Austin
WM. H. STRANG, Z. H. MISCHKA, ELTON STERRETT.....Houston

PUBLISHED BY
THE GULF PUBLISHING COMPANY
HOUSTON, TEXAS

R. L. DUDLEY, *President*
A. L. BURNS, *General Manager*
S. W. ROBINSON, *Editorial Director*
TOM W. NELSON, *Advertising Manager*

Staff correspondents at all important points.

Member Audit Bureau of Circulation
Member Associated Business Papers, Inc.

BRANCH OFFICES
NEW YORK.....250 Park Ave.
PITTSBURGH.....Vandergrift Bldg.
CHICAGO.....332 S. Michigan Ave.
LOS ANGELES..W. W. Wilson Bldg., Huntington Park, Calif.
TULSA.....Hunt Bldg.
FORT WORTH.W. T. Waggoner Bldg.
SAN ANTONIO.....Smith Young Tower Bldg.
WASHINGTON.....Albee Bldg.

ADVERTISING STAFF
DICK SWINSKY.....New York
C. A. WARDLEY.....Pittsburgh
H. G. FITZPATRICK.....Chicago
J. F. CARTER, JR.....Tulsa
JAY CURTS, JR.....Los Angeles
CHAS. WYATT.....Houston

CIRCULATION DEPARTMENT
J. T. WAGONER.....Manager

SPECIALIZED OIL JOURNALS
Published by
THE GULF PUBLISHING COMPANY

The Oil Man's Calendar

OCT. 7–10	American Gas Association, Atlantic City, N. J.
7–11	National Safety Congress and Exposition, Chicago.
15	National Stripper Well Association, Dallas.
16–18	Independent Petroleum Association of America, Dallas.
17–18	American Institute of Mining & Metallurgical Engineers, Petroleum Division, Los Angeles.
24–26	American Institute of Mining & Metallurgical Engineers, Petroleum Division, Tulsa.
25	Western Petroleum Refiners Association, Regional Meeting, Shreveport.
31–Nov. 2	Texas Mid-Continent Oil & Gas Association, Ft. Worth.
NOV. 1	California Natural Gasoline Association, Los Angeles.
7–8	American Association of Petroleum Geologists, Pacific Section, Los Angeles.
11–15	American Petroleum Institute, Chicago.
1941 FEB. 22	North Texas Oil & Gas Association, Wichita Falls.
27–28	American Petroleum Institute, Division of Production, Southwestern District, Shreveport.

Contents « October 7, 1940
Volume 99, Number 5

The Week's Panorama..... 11

Feature Section:

This Year Indicated as Third Most Active in Drilling... 12

Modern Well Studies..... 15
By FRANK BRIGGS

A Decade of East Texas—Colossus of Oil..... 19

Stripper Wells Automatically Disconnected When Fluid Level Becomes Low..... 46

Removing Air Pockets With Suction Pumps..... 50
By F. R. COZZENS

Drilling Contractors' Note Book..... 59

News Section and Index..... 63

Looking Ahead With the Editor..... 4

Letters to the Editor..... 6

Notes for the Equipment Buyer and User.....101

Squeaks from the Bull Wheel.....104

Index to Advertisers.....106

Published every Monday. Single Copies 15 cents (Special Issues 50c). Subscription price: domestic and foreign, $2.00 a year; 2 years $3.00. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879. Subscription restricted to those engaged in the producing and pipe line branches of the oil industry or the manufacturing and distribution of oil field supplies. Advertising rates on application.

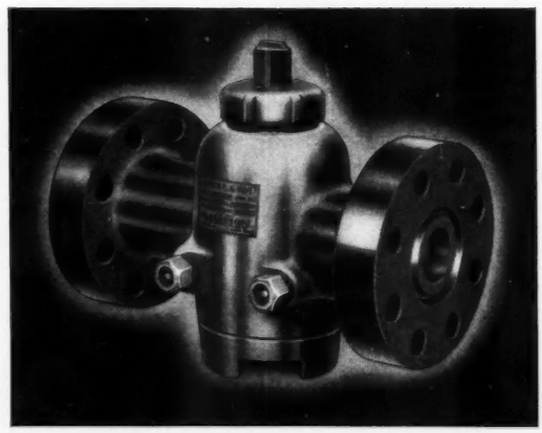
Copyrighted 1940, by The Gulf Publishing Company.

Mission 1940 Plug Valve ***Gay Nineties Plug Valve***

THE 1940 MISSION PLUG VALVE has line pressure lubrication which is constantly urging grease to the sealing grooves. Grease grooves completely encircle both port openings, forming a perfect seal. The combination assures you of long service and easy operation.

THE GAY NINETIES PLUG VALVE is lubricated only when you remember to do it. Lacking constant pressure, there cannot be a constant seal. Old-style grease grooves often mean spotty sealing. Poor sealing will greatly cut down valve life.

- **Hundreds are now in use on drilling rigs, flow lines, Christmas trees and in repressuring plants.**
- **Manufactured in 2″, 3″, 4″ sizes — in three grades to meet working pressures of 2000, 3000 and 5000 lbs.**
- **Available at leading oil well supply stores. Install Mission valves in your most difficult conditions.**



MISSION
MANUFACTURING CO.
HUMBLE ROAD, HOUSTON, TEXAS
EXPORT OFFICE 30 ROCKEFELLER PLAZA, NEW YORK

THE OIL WEEKLY

OCTOBER 7, 1940

VOLUME 99 NUMBER 5

The Week's Panorama

INDUSTRIAL production for 1940 as a whole is expected to be about 10 percent greater than in 1939. Further increases from present levels are expected to raise activity by the end of 1940 to the all-time high that was reached at the close of 1939.

• • • Expansion of industrial activity is anticipated because of the national-defense program, government buying in many lines, maintenance of residential building on a comparatively large scale, and relatively good purchasing power of agricultural as well as industrial workers, with gains in domestic demand for farm products compensating for losses of export business.

• • • Operations of the oil industry lately have been proceeding at an economically dangerous pace. Both crude production and refinery runs were seriously excessive in the week ended September 28, latest period for which complete statistics are available, although the excessive crude output was only temporary and due to be compensated later by underproduction. Gasoline production showed a small decrease from the output in the previous week, but still was so large that the industry was not able to withdraw from storage a quantity that would have been normal for this time of the year.

• • • United States crude-oil production was within about 100,000 barrels of the all-time peak in averaging almost 3,800,000 barrels daily in the week of September 28. At that rate, the wells were putting out 275,000 barrels a day more than the estimated daily average market requirements for the fall-winter period. (Economists have calculated that limitation of crude production to an average of 3,525,000 barrels daily for the whole period would be necessary for holding gasoline stocks down to actual requirements of 85,000,000 barrels as of March 31, 1941.)

• • • The excess of crude production for the week of September 28 should be largely offset, however, by underproduction in the week ended October 5. Texas' proration schedule called for only 1 day of shutdowns in the September 28 week and 3 shutdown days in the week of October 5. (After having averaged 1,316,650 barrels daily in the previous week, Texas produced 1,517,300 a day in the week of September 28 and was wholly responsible for the gain of nearly 200,000 barrels in United States production. But the Texas output was expected to drop back virtually to 1,000,000 barrels in the week of October 5, in a decline that would hold the output of the state and the nation approximately within market demand for the mentioned two weeks as a whole.)

• • • Similarly, scheduled allowables in the prorated states indicate that United States crude production for October will be close to the prevailing market demand for domestic crude.

• • • Actual production probably will be around 80,000 barrels a day in excess of market demand in the 8 prorated states, which account for 83 percent of United States output. Those states include Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, and Michigan.

• • • That excess will be partially offset, however, by the inability of Illinois to produce as much oil as the market would absorb. Illinois output currently is falling short of market demand by about 45,000 barrels daily. For the United States as a whole, therefore, crude production in October likely will not exceed indicated market demand more than about 35,000 barrels daily, or about 1,000,000 barrels for the month.

• • • More serious than the recent temporary over production of crude was the continuance of refinery runs at higher rates than economically advisable. After having almost duplicated the all-time peak in the previous week, the runs were cut 80,000 barrels to 3,600,000 daily in the week of September 28. But even at the lower level, they exceeded by 200,000 barrels the daily average of 3,400,000 barrels calculated as necessary during the fall and winter for holding gasoline stocks to the economically desirable level at the beginning of spring.

• • • As might have been expected, in view of the trend of runs to stills, the industry produced only 300,000 barrels less gasoline in the week of September 28 than in the previous week, when output set a record for 1940 and almost equaled the all-time peak.

• • • One of the country's forgotten men, not connected with the oil industry, and a satisfied buyer of petroleum products, commented incisively on the new anti-trust suit against the oil industry. On the one hand, said he, the government exhorts industry to give team-work in a concerted, coordinated national defense effort. And it similarly is more and more centralizing and coordinating governmental functions. Yet on the other hand, said the citizen, the government contemplates tearing up the oil industry and disconcerting its smoothly functioning operations.

This Year Indicated as Third Most Active in Drilling

IN VIEW of continued brisk drilling, it appears virtually certain that 1940 will go down on the records as the third most active year in the history of the industry, by accounting for more well completions than any other year except 1920 and 1937.

The oil and gas companies drilled 33,911 wells in 1920, in response to a $3 price for crude oil, and 33,112 in 1937; and those have been the only two years so far in which more than 30,000 wells annually have been drilled, the third-ranking year up to now having been 1926, with approximately 29,000 completions.

If field work should be maintained in October, November, and December, at about the same level as in September, a normal trend for the close of the year, 1940 would account for approximately 31,000 new wells.

In September, completions averaged practically 600 weekly, and 13 weeks remained in the year, indicating that about 7800 more wells would be completed if drilling did not slump, following completion of 23,445 wells in the first 9 months of 1940.

That development will be maintained or increased in the final three months is indicated by experience in most other years since the depression and by present circumstances.

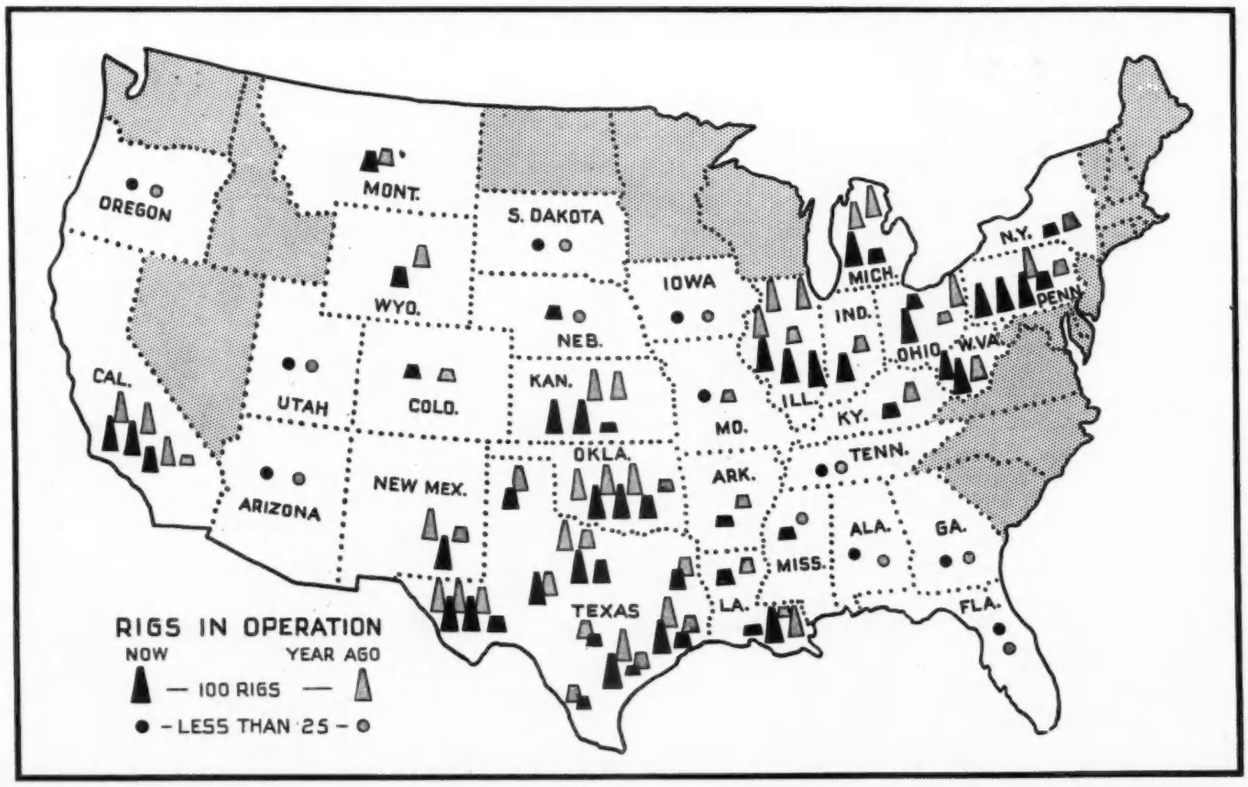
The average number of completions per day ran higher in the last three months than in September in 1933 and 1934, was about the same in 1935 and 1936, was lower in 1937, and was higher again in 1938 and 1939. Only in the unusual business-recession period of late 1937, therefore, has there been in recent years a curtailment of drilling after the close of September.

Tending to prevent any curtailment of development in late 1940, if not to cause an acceleration of field work, will be the extraordinary general business situation and the relatively good situation within the oil industry.

All signs point to further expansion henceforth of industrial activity, which will assure relatively large employment and consumer purchasing power. Good business in most lines consequently is prom-

Drilling Rigs in Operation Now as Compared with Year Ago, by Districts

This map-chart is based on detailed figures shown in an accompanying table.



ised, and sales of petroleum products, accordingly, should be comparatively brisk. The general business background will be conducive, therefore, to large demand for petroleum and to field work in line with the extensive market requirements.

Furthermore, the petroleum industry is in a generally satisfactory inventory position, with exception of an over-supply of gasoline, and the markets within the industry should be sufficiently firm to give producers confidence to go ahead with the drilling of new wells.

The natural decline of Illinois crude oil production has been definitely conducive to greater confidence in the future of the crude market, as there is now no serious threat of overproduction.

And paradoxically, it is conceivable that the lately filed anti-trust suit against the oil companies may indirectly encourage drilling. For one of the asserted objectives of the case is the bringing about of better prices to producers for crude oil, and the suit may be expected to cause the larger companies to be reluctant to reduce crude postings, even if market conditions should seem to justify such reductions.

September Drilling

Although drilling was curtailed somewhat in July after reaching the year's peak in June, there was not much further retrenchment in August or September.

In September, 1940, well completions in the United States averaged 85.4 daily, compared with 86.1 in August and 87.7 in July. However, the field work in September, 1940, was greater than that for September of any other post-depression year except 1937.

Daily average completions in September in recent years have been as indicated herewith:

September of:	Wells Completed Daily
1933	43.0
1934	50.0
1935	63.7
1936	77.7
1937	99.2
1938	75.4
1939	70.6
1940	85.4

The comparatively slow field work of September last year was due to the interruption of normal operations by the shutdowns of the fields of the Mid-Continent in the latter half of August.

First 9 Months

In the first 9 months of 1940, 23,445 wells were completed in the United States, or 19.1 percent more than the 19,678 finished in the corresponding months of 1939. Field work thus has continued to exceed general expectations of the early part of this year.

Cumulative completions in the first 9 months of recent years have been as herewith indicated:

First 9 Months of:	Total Wells Completed
1933	7,950
1934	13,706
1935	17,072
1936	19,864
1937	24,565
1938	20,507
1939	19,678
1940	23,445

Most districts and states have contributed toward the national increase of completions for 1940 as compared with 1939. The exceptions have included Kentucky, Michigan, Arkansas, Eastern Texas, and the San Antonio district of Southwest Texas.

Mainly responsible for the declines of field work in Kentucky, Michigan, and Arkansas have been the poor results in finding new fields.

Among the increases in drilling, that in Mississippi has been outstanding, as 145 wells were completed in the state in the first 9 months of 1940, compared with 11 in the corresponding months of 1939. Aside from development of the Tinsley field, first oil producing area of the state, there has been considerable wildcatting this year, although without particularly encouraging results.

Indiana has had twice as much drilling in 1940 as in 1939, and North Louisiana has had nearly twice as much.

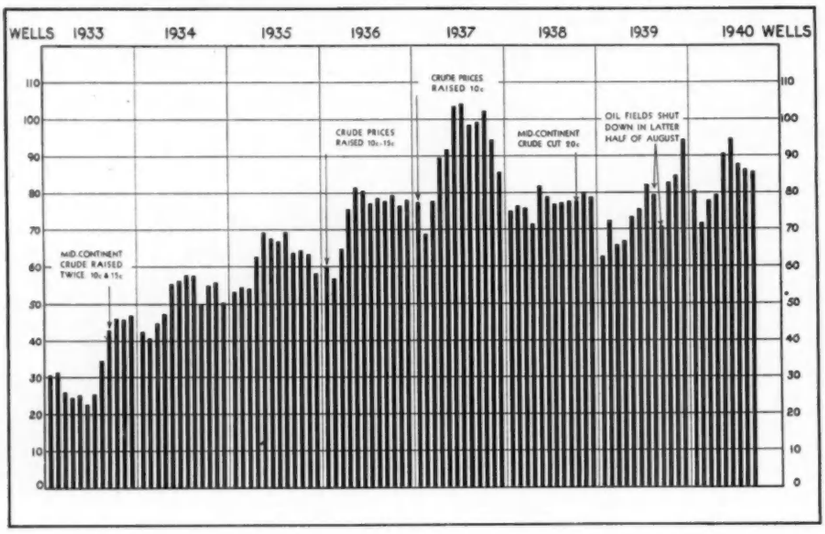
Because of better average prices for Pennsylvania-grade crude in 1940 than in 1939, there has been three-fourths again as much drilling this year as there was last year in Pennsylvania and New York. As compared with 1760 completions in Pennsylvania in the first nine months of 1939, there were 3005 in the like months of 1940, while New York completions increased from 430 to 771.

Other gains of over 50 per cent this year in well completions have

More Rigs Taken Out of Service in September, But Number Now Active Greater Than Total at This Time Last Year

STATE OR DISTRICT	TOTAL RIGS IN OPERATION Drilling, Rigs Up, Shut Down: Year Ago (Oct. 1, 1939)	Month Ago (Sept. 1, 1940)	Now (Oct. 1, 1940)	Percent Change From Year Ago	DETAILS OF OCTOBER 1, 1940 FIELD ACTIVITY: Rigs in Operation: Drilling	Rigs Up	Shut Down	Prelim. Activity: Derricks	Locations	Total Operations
Alabama	4	9	8	+100.0	4	...	4	...	1	9
Arizona	8	7	7	— 12.5	1	...	6	...	1	8
Arkansas	36	23	23	— 36.1	12	2	9	...	2	25
California	325	278	273	— 16.0	188	62	23	...	44	317
Colorado	27	30	32	+ 18.5	10	...	22	...	2	34
Florida	4	3	3	— 25.0	1	...	2	...	...	3
Georgia	1	...	2	+100.0	...	...	2	...	1	3
Illinois	355	485	303	— 14.6	261	14	28	23	141	467
Indiana	62	89	94	+ 51.6	42	2	50	...	14	108
Iowa	1	3	3	+200.0	1	...	2	...	...	3
Kansas	193	258	224	+ 16.1	191	17	16	18	10	252
Kentucky	73	62	66	— 9.6	29	4	33	...	...	66
Louisiana	192	171	179	— 6.8	139	15	25	13	44	236
North Louisiana	59	44	56	— 5.1	27	5	24	7	...	63
South Louisiana	133	127	123	— 7.5	112	10	1	6	44	173
Michigan	200	131	143	— 28.5	97	27	19	13	26	182
Mississippi	15	34	23	+ 53.3	16	3	4	7	7	37
Missouri	22	19	16	— 27.3	6	...	10	1	...	17
Montana	31	47	61	+ 96.8	34	6	21	1	5	67
Nebraska	1	24	26	+2500.0	18	1	7	5	4	35
New Mexico	158	121	106	— 32.9	81	1	24	...	10	116
New York	57	62	41	— 28.1	30	4	7	3	7	51
Ohio	121	347	251	+107.4	161	51	39	15	38	204
Oklahoma	334	290	284	— 15.0	211	33	40	35	21	340
Oregon	1	1	1	0.0	...	...	1	...	...	1
Pennsylvania	124	358	352	+183.9	258	31	63	24	64	440
South Dakota	....	1	1	.....	....	1	...	...	...	1
Tennessee	9	9	9	0.0	4	1	4	2	2	13
Texas	1,130	1,058	1,000	— 11.5	767	67	166	57	399	1,396
East Texas Field	18	10	16	— 11.1	13	3	...	1	7	24
East Texas Border Co.'s	14	13	13	— 7.1	7	2	4	...	...	13
Rest of East Texas	43	39	42	— 2.3	26	3	13	2	5	49
North Texas	174	163	173	— 0.6	135	8	30	9	62	244
South Texas	287	281	211	— 26.5	162	20	29	15	89	315
Corpus Christi Area	161	151	114	— 29.2	88	12	14	10	68	192
Laredo Area	66	76	58	— 12.1	48	4	6	3	14	75
San Antonio Area	60	54	39	— 35.0	26	4	9	2	7	48
Texas Gulf Coast	125	124	135	+ 8.0	127	5	3	14	40	189
Texas Panhandle	94	80	72	— 23.4	58	9	5	6	16	94
West Texas	295	246	233	— 21.0	181	9	43	10	94	337
West Central Texas	80	102	105	+ 31.2	58	8	39	...	26	131
Utah	2	6	9	+350.0	5	...	4	...	...	9
West Virginia	70	202	213	+204.3	153	22	38	15	36	264
Wyoming	69	66	68	— 1.4	31	2	35	...	8	76
Total United States	3,625	4,194	3,821	+ 5.4	2,751	366	704	232	827	4,880

Average Daily Well Completions in U. S. by Months


WELLS 1933 1934 1935 1936 1937 1938 1939 1940 WELLS
MID-CONTINENT CRUDE RAISED TWICE 10c & 15c
CRUDE PRICES RAISED 10c-15c
CRUDE PRICES RAISED 10c
MID-CONTINENT CRUDE CUT 20c
OIL FIELDS SHUT DOWN IN LATTER HALF OF AUGUST

included those in Kansas, South Louisiana, the Texas Panhandle and West Central Texas.

Increases of over 30 percent have occurred in Montana and North Texas, while Wyoming has had about 20 percent more completions this year than last year.

Smaller gains have included those of 2.7 percent in California, 14.1 percent in Illinois, 13.3 percent in New Mexico, 8.3 percent in Ohio, 8.1 percent in Oklahoma, 7.9 percent in Texas as a whole, 6/10 of 1 percent in the Corpus Christi area of Southwest Texas, 12.2 percent in the Laredo area of Southwest Texas, 2.2 percent in West Texas and 4.2 percent in Wyoming.

As compared with 995 completions in the first nine months of 1939 in Kansas, there were 1506 in the like months of 1940, and similar increases in other districts included those from 531 to 800 in South Louisiana, from 293 to 497 in the Texas Panhandle, from 353 to 563 in West Central Texas, from 100 to 136 in Montana, from 1241 to 1627 in North Texas and from 87 to 106 in Wyoming.

Similarly, completions for the first nine months rose from 816 in 1939 to 838 in 1940 in California, from 2644 to 3018 in Illinois, from 452 to 512 in New Mexico, from 690 to 747 in Ohio, from 1487 to 1608 in Oklahoma, from 7080 to 7640 in all Texas, from 998 to 1004 in the Corpus Christi area, from 745 to 836 in the Laredo area, from 1513 to 1547 in West Texas, and from 87 to 106 in Wyoming.

Drilling Maintained on Large Scale in Most Active September of Post-Depression Period With Exception of That Month in 1937

STATE OR DISTRICT	MONTHLY COMPLETIONS: Total			MONTHLY COMPLETIONS: Details for September, 1940[1]				CUMULATIVE COMPLETIONS: First 9 Months: Total			CUMULATIVE COMPLETIONS: Details for 9 Months of 1940			
	Year Ago (Sept., 1939)[2]	Month Ago (Aug., 1940)[3]	Latest Data (Sept., 1940)[1]	Oil	Gas	Dry	Initial Oil Production	1939	1940	Percent Change	Oil	Gas	Dry	Initial Oil Production
Alabama	....	1	2	....	....	2	.....	.....	6	.....	.....	.....	6	.....
Arizona	1	....	....	....	....	....	.....	1	.....	.....	.....	.....	.....	.....
Arkansas	18	18	17	11	3	3	2,650	178	142	— 20.2	96	7	39	27,251
California[4]	88	113	74	64	....	10	46,524	816	838	+ 2.7	694	11	133	649,119
Colorado	....	1	1	1	....	....	100	15	6	— 60.0	1	.....	5	100
Florida	....	....	....	....	....	....	.....	.....	1	.....	.....	.....	1	.....
Georgia	....	....	....	....	....	....	.....	1	.....	.....	.....	.....	.....	.....
Illinois	217	412	334	258	1	75	62,753	2,644	3,018	+ 14.1	2,491	19	508	1,782,618
Indiana	47	62	53	32	4	17	5,495	162	357	+ 120.4	174	45	138	23,994
Kansas	89	216	180	135	5	40	214,822	995	1,506	+ 51.4	1,159	46	301	1,776,136
Kentucky	64	41	36	19	1	16	1,693	486	260	— 46.5	118	6	136	7,189
Louisiana	96	155	118	84	12	22	18,607	774	1,253	+ 61.8	923	71	259	230,046
North Louisiana	18	61	53	39	9	5	3,900	243	453	+ 86.4	318	59	76	35,341
South Louisiana	78	94	65	45	3	17	14,707	531	800	+ 50.6	605	12	183	194,705
Michigan	134	101	90	35	8	47	7,124	1,069	924	— 13.6	468	36	420	88,100
Mississippi	4	15	16	6	....	10	5,865	11	145	+1218.0	71	1	73	43,874
Missouri	7	6	4	....	2	2	.....	33	17	— 48.5	.....	6	11	.....
Montana	14	14	18	11	4	3	1,791	100	136	+ 36.0	104	11	21	11,426
Nebraska	....	7	4	1	....	3	750	.....	12	.....	2	.....	10	1,137
New Mexico	54	52	42	31	....	11	6,996	452	512	+ 13.3	403	12	97	148,833
New York	[6]57	[6]89	[6]68	[6]67	....	1	195	[6]430	[6]771	+ 79.3	[6]755	7	9	2,882
Ohio	100	136	123	36	42	45	712	690	747	+ 8.3	327	229	191	3,438
Oklahoma	116	196	145	85	10	50	15,980	1,487	1,608	+ 8.1	898	120	590	227,054
Pennsylvania[5]	[6]238	[6]401	[6]367	[6]337	20	10	265	[6]1,760	[6]3,005	+ 70.7	[6]2,710	184	111	2,142
South Dakota	....	....	....	....	....	....	.....	.....	1	.....	.....	.....	1	.....
Tennessee	....	....	....	....	....	....	.....	.....	8	.....	3	1	4	833
Texas	570	903	643	452	22	169	289,853	7,080	7,640	+ 7.9	5,541	227	1,872	3,156,216
East Texas Field	16	27	25	23	....	2	67,335	349	218	— 37.5	206	.....	12	383,692
Rest of East Texas	29	26	28	15	3	10	2,568	236	204	— 13.6	88	38	78	26,171
North Texas	96	183	134	93	....	41	44,633	1,241	1,627	+ 31.1	1,106	9	512	611,465
South Texas	179	244	187	108	9	70	43,994	2,047	2,041	— 0.3	1,278	58	705	482,774
Corpus Christi Area	99	124	98	64	7	27	36,804	998	1,004	+ 0.6	716	28	260	371,663
Laredo Area	58	99	72	39	1	32	7,016	745	836	+ 12.2	492	29	315	103,995
San Antonio Area	22	21	17	5	1	11	174	304	201	— 33.8	70	1	130	7,116
Texas Gulf Coast	100	102	60	50	1	9	11,691	1,048	943	— 10.0	750	20	173	190,732
Texas Panhandle	32	75	38	31	6	1	6,687	293	497	+ 69.6	409	72	16	119,691
West Texas	100	172	128	114	....	14	110,071	1,513	1,547	+ 2.2	1,432	10	105	1,276,870
West Central Texas	18	74	43	18	3	22	2,874	353	563	+ 59.5	272	20	271	64,821
Utah	....	....	....	....	....	....	.....	.....	2	.....	.....	1	1	.....
West Virginia	49	57	52	9	36	7	32	407	424	+ 4.2	91	261	72	633
Wyoming	13	17	4	4	....	....	1,406	87	106	+ 21.8	84	3	19	70,644
Total United States	1,976	3,013	2,391	1,678	170	543	683,613	19,678	23,445	+ 19.1	17,113	1,304	5,028	8,253,665

[1] Wells completed in the 4 weeks, or 28 days, ended September 28, 1940. [2] Wells completed in the 4 weeks, or 28 days, ended September 23, 1939. [3] Wells completed in the 5 weeks, or 35 days, ended August 31, 1940. [4] California completions except for August and September, 1940, revised in accordance with the American Petroleum Institute. [5] Bradford, Pennsylvania, completions except in August and September, 1940, revised in accordance with The Producers Monthly. [6] Includes water-intake wells.

Modern Well Studies

By FRANK BRIGGS

Engineer, The S. M. Jones Company

PART I

Use in Selection of Equipment

DURING the brief time in which modern well studies have been in existence, there has arisen an ever expanding appreciation for this type of work, and a very definite need for a vast amount more. The desire for this type of work is the natural result of the realization that the once "house of plenty" is no more, that the highest degree of efficiency must be obtained from all phases of production, and that conservation has of necessity surplanted the era of waste.

In the forefront of this trend toward the use of field engineering work, there have been outstanding pioneers and theorists (as there are in all new fields of endeavor) who have each supplied or contributed a piece of the whole plan. It is hoped herein to gather the outstanding work contributed to the field by some of these men, and assimilate it with certain practical experience obtained through numerous well studies, into a complete picture or form readily usable by the average production man and engineer.

With the above principle in mind, this discourse has been divided into four well defined parts, namely: (1) Use in selection of equipment; (2) well study instruments; (3) interpretation of well study results; and (4) use in proper counterbalancing of wells. The accompanying article discusses the first part, with others to appear in forthcoming issues.

THE term "well study" has become synonymous with "dynamometer study" and for this reason it may appear that the first requisite of the engineer preparing to install equipment on a new well would be that of a slight of hand artist, in order to make a study of a well, as yet, not even provided with a polished rod upon which to attach a dynamometer. A well study, however, has a much broader application and should in no way be limited to the narrow uses of the dynamometer alone. To the contrary, field engineering practices are broad enough to include the preliminary survey for installations of equipment on a proposed pumping installation.

It has been said[1] that "the problem of equipment selection is not primarily that of rating the equipment, but is the more difficult problem of rating the well." In doing this, the selection of equipment designed to operate in a particular well must consider all equipment as an intregal part. In other words, the pump, the sucker rod string, the walking beam, the crank and the prime mover effect the performance of each other as much as a piston, piston rod, crank, crank pin, cross-head, etc., effect and determine the operation of a unit such as an engine.

Selection of Pumping Equipment

In selecting pumping equipment, the primary consideration is the amount of fluid to be produced. This quantity of fluid is dependent upon either the reservoir supply, legal restrictions or equipment limitations. The procedure involved in the selection of pumping equipment is based upon the assumption that a definite amount of fluid is desired and can be produced (determined from data available on neighboring wells, pool studies, bottom hole pressure measurements, etc.) from the particular well to be outfitted. After this primary consideration has been determined, it is necessary to select equipment with regard to the loads to be encountered and the torque and engine requirements. After these secondary factors have been determined, it is then necessary to make the detail choices, such as type of alloy steel to be used in the sucker rods to meet the corrosive or non-corrosive fluid conditions of the well, etc.

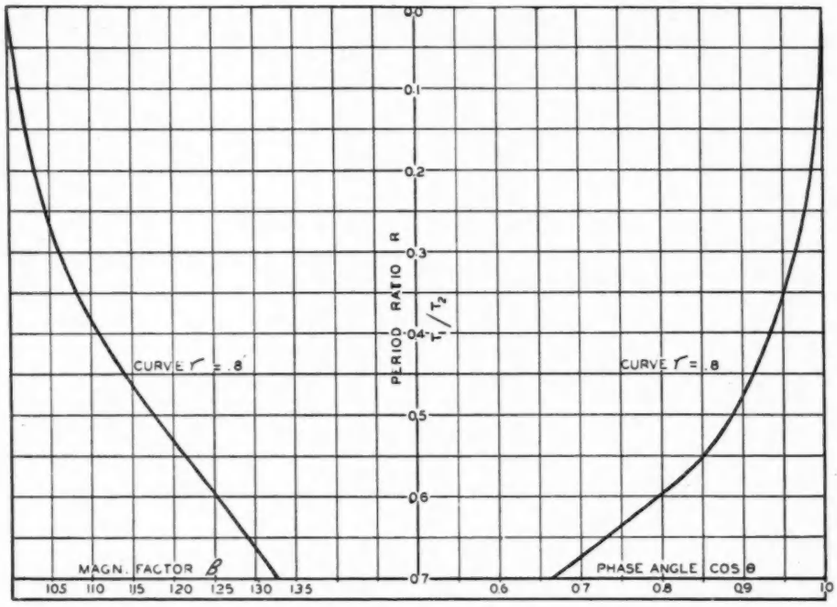
Example—As means of illustrating the procedure and processes involved in arriving at the selections stated above, it is thought that this information can best be presented by means of the following example:

Procedure—Briefly, the procedure followed is to compute (in this case by Rieniet's formula) the amount of plunger travel to be expected from the possible operating combinations of speed and stroke and pump sizes which will give the desired production (in this case 600 barrels of fluid) per day. A satisfactory apparent volumetric efficiency must also be accounted for. The maximum polished rod load (computed by means of multiplying the dead weight load by an acceleration factor) is determined for each of the combinations stated above. The final results may then be plotted and from graphical representations, a suitable size of pump and an adequate normal operation may be selected.

Computation of Plunger Travel: There are at least three methods available for computing the probable travel of the plunger. (See forthcoming Part 3.) Of these, the formula[2] which considers the sucker rod string and the pump as a spring with a load, is selected for this problem. The pump sizes

FIGURE 1-A

Chart for determination of β and Cos θ



(selected for their range and adaptability in producing the desired production) to be considered for this problem are as follows: 2-inch, 2¼-inch, 2½-inch, 2¾-inch, 3¼- and 3¾-inch. Three proposed lengths of pumping strokes are also considered and these are namely: the 54-inch, the 64-inch and the 74-inch length of stroke. For each definite length of pumping stroke, the plunger travel to be expected from the individual pump sizes listed above and operated at a speed (assuming an apparent volumetric efficiency of 80%) which will produce 600 barrels of fluid, is computed.

$$S_p = S_s \text{ Cos } \theta + \frac{Q\beta}{K} - \frac{2W_f}{K} - \frac{F}{K} \text{ (Rieniet's Formula*)}$$

Where:

S_p = Plunger stroke in inches
S_s = Polished rod stroke
θ = Phase angle determined from Figure 1-A
Q = Total differential at the polished rod due to fluid load and the acceleration of both the fluid and the rods
β = Magnification factor determined from Figure 1-A
K = Spring constant of the rods, lb./in. of stretch
W_f = Weight of fluid supported on the plunger
F = Rod friction load in pounds

Data:

Amount of fluid to be produced.....600 barrels
Depth of well.....4050'
Rod string.....1300'-1" & 2750'-⅞"
Plunger diameter .....3¼"
Length of Stroke..... 54"
*Speed of Operation.....8.5 S.P.M.

*8.5 × 54" × Prod. Constant × 80% = 600 bbls. of production
8.5 × 54" × 1.64 × .8 = 600 Approx.

Calculations:

Weight of Fluid Column = W_f = 4050' × .434 × (Area of Plunger—rod area)
= 4050' × .434 × (11.045—.601)
= 18370 lbs.

Weight of rods = W_r = 13.00 × 288 + 27.50 × 216
= 3740 + 5940 = 9680 lbs.

$$\text{Acceleration Factor} = C = \frac{w^2 r}{g} = \frac{(\text{Ang. Vel. of crank})^2 \times \frac{1}{2} \text{ Pol. Rod Stroke}}{32.2 \times 12}$$

$$= \frac{\left(\frac{8.5 \times 2\pi}{60}\right)^2 \times \frac{54}{2}}{386} = 0.055$$

Total Diff. Load = $Q = W_f (1+c) + 2W_r C$
= 18370 (1.005) + 2.9680 (.055)
= 20450 lbs.

$$\text{Period Ratio} = R = \frac{T_1}{T_2} = \frac{\text{Period of natural vibrations of rods}}{\text{Period of forced vibrations}}$$

$$T_1 = \frac{4 \times \text{length of rod string}}{\text{Speed of sound in the rods}} = \frac{4 \times 4050}{17000}$$

$$T_2 = \frac{60}{\text{SPM}} = \frac{60}{8.5}$$

$$R = \frac{\frac{4 \times 4050}{17000}}{\frac{60}{8.5}} = .136$$

Now with this value of R, Figure 1-A and Figure 1-B are consulted to obtain Cos θ and β.

Cos θ = .990
β = 1.017

$$\text{Spring Constant} = K = \frac{\text{Area of Rods} \times \text{Youngs Modulus}}{\text{Length of rods}}$$

$$= \frac{30 \times 10^6}{\left(\frac{1300}{.786} + \frac{2750}{.601}\right)12} = 401 \text{ lb./in. of Stretch}$$

Plunger Travel:

$$S_p = S_s \text{ Cos } \theta + \frac{Q\beta}{K} - \frac{2W_f}{K} - \frac{\dagger F}{K}$$

$$= 54 \times .99 + \frac{20450 \times 1.017}{401} - \frac{2 \times 18370}{401}$$

$$= 53.5" + 51.8" - 91.85 = 13.5"$$

* See derivation in Part 3.

† This friction factor neglected in these calculations.

FIGURE 1-B

Optimum Pumping Conditions

54" STROKE				64" STROKE				74" STROKE			
	Plunger (Cal.)		Cal. Pol.		Plunger		Cal. Pol.		Plunger		Cal. Pol.
Speed S.P.M.	Size	Travel	Rod Load	Speed S.P.M.	Size	Travel	Rod Load	Speed S.P.M.	Size	Travel	Rod Load
8.5	3¾"	13.5"	29,600 lb	7.15	3¾"	23.2"	29,450 lb	6.2	3¾"	32.1"	29,200 lb
11.25	3¼"	28.5"	25,400	9.5	3¼"	37.1"	25,000	8.2	3¼"	46.0"	24,800
15.75	2¾"	42.5"	22,600	13.3	2¾"	53.2"	22,100	11.5	2¾"	60.9"	21,600
19.1	2½"	54.4"	22,100	16.1	2½"	60.4"	21,200	14.0	2½"	68.3"	20,700
23.5	2¼"	66.5"	22,200	20.0	2¼"	72.1"	21,200	17.2	2¼"	78.5"	20,400
29.75	2"	107.1"	23,800	25.0	2"	87.2"	22,200	21.7	2"	89.2"	20,500

Computation of Polished Rod Loads: In view of the fact that the maximum polished rod load is dependent upon an acceleration factor, each speed of operation would have a different load.

This load is the total (W_r+W_f) dead weight load multiplied by the acceleration factor plus one.

$(W_f + W_r) \times (1 + \frac{w^2 r}{g})$ or in this case

$(18370 + 9680) \times (1 + .055) = 28050 \times 1.055 = 29600$ lbs.

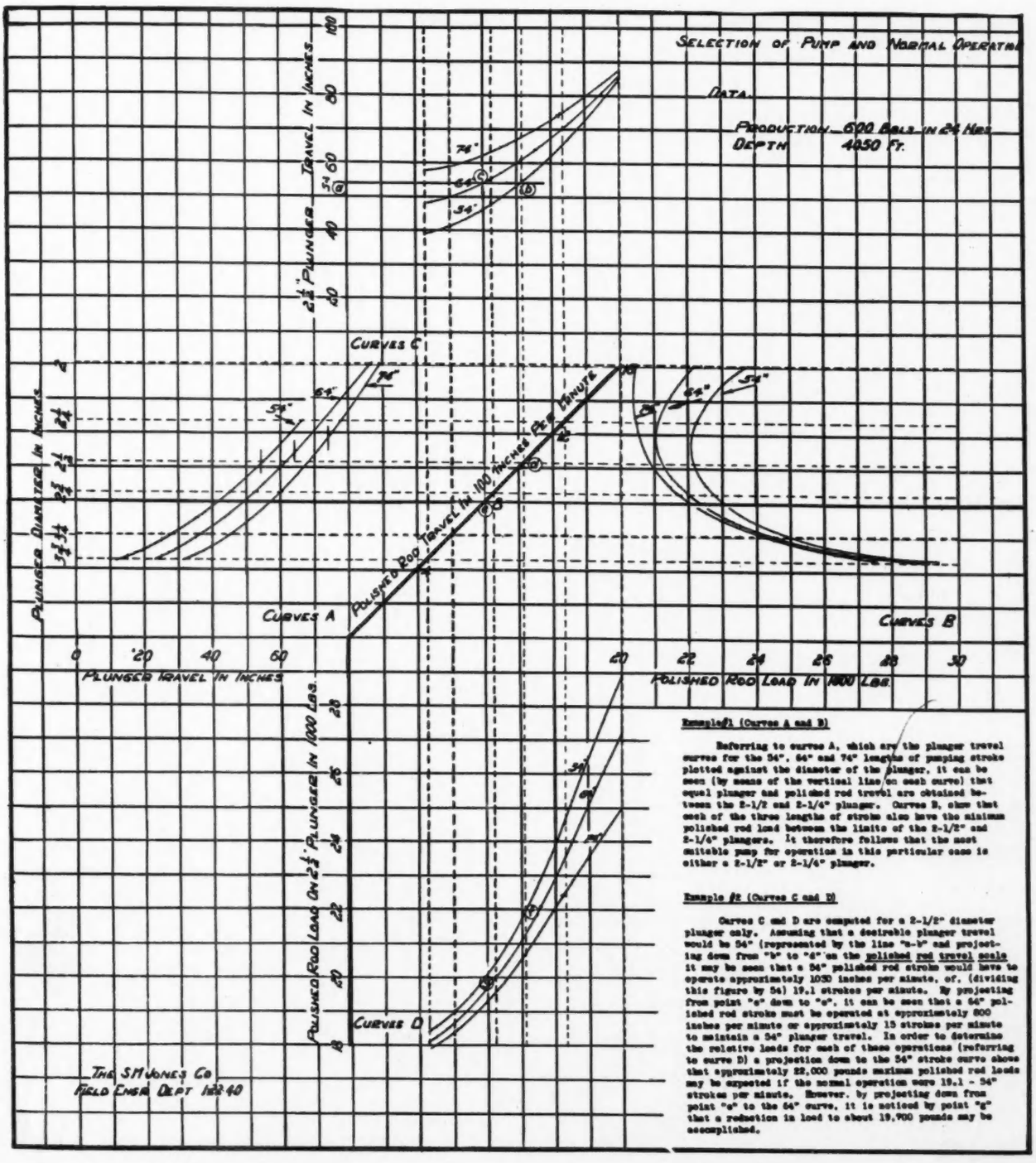
Plunger Selection Procedure

The calculations involved are repeated for each plunger size and comparable speed to obtain 600 barrels of fluid. Tables similar to those shown are then prepared for each length of pumping stroke.

In selecting the most optimum pump size for certain operation, a convenient aid is to plot the information from the above tables into curves as shown in Figure 2.

General experience, combined with theoretical calculations,[3] have tended to show that the best

FIGURE 2


SELECTION OF PUMP AND NORMAL OPERATING
DATA.
PRODUCTION 600 BBLS IN 24 HRS
DEPTH 4050 FT.
PLUNGER DIAMETER IN INCHES
PLUNGER TRAVEL IN INCHES
PLUNGER TRAVEL IN INCHES
POLISHED ROD LOAD IN 1000 LBS.
POLISHED ROD TRAVEL IN 100 INCHES PER MINUTE
CURVES A
CURVES B
CURVES C
CURVE D
74"
64"
54"
THE S.M. JONES CO
FIELD ENGR. DEPT 1-12-40
Example #1 (Curves A and B)
Referring to curves A, which are the plunger travel curves for the 54", 64" and 74" lengths of pumping stroke plotted against the diameter of the plunger, it can be seen (by means of the vertical line on each curve) that equal plunger and polished rod travel are obtained between the 2-1/2 and 2-1/4" plunger. Curves B, show that each of the three lengths of stroke also have the minimum polished rod load between the limits of the 2-1/2" and 2-1/4" plungers. It therefore follows that the most suitable pump for operation in this particular case is either a 2-1/2" or 2-1/4" plunger.
Example #2 (Curves C and D)
Curves C and D are computed for a 2-1/2" diameter plunger only. Assuming that a desirable plunger travel would be 54" (represented by the line "a-b" and projecting down from "b" to "d" on the polished rod travel scale it may be seen that a 54" polished rod stroke would have to operate approximately 1030 inches per minute, or, (dividing this figure by 54) 19.1 strokes per minute. By projecting from point "c" down to "e", it can be seen that a 64" polished rod stroke must be operated at approximately 800 inches per minute or approximately 15 strokes per minute to maintain a 54" plunger travel. In order to determine the relative loads for each of these operations (referring to curve D) a projection down to the 54" stroke curve shows that approximately 22,000 pounds maximum polished rod loads may be expected if the normal operation were 19.1 - 54" strokes per minute. However, by projecting down from point "e" to the 64" curve, it is noticed by point "g" that a reduction in load to about 19,700 pounds may be accomplished.

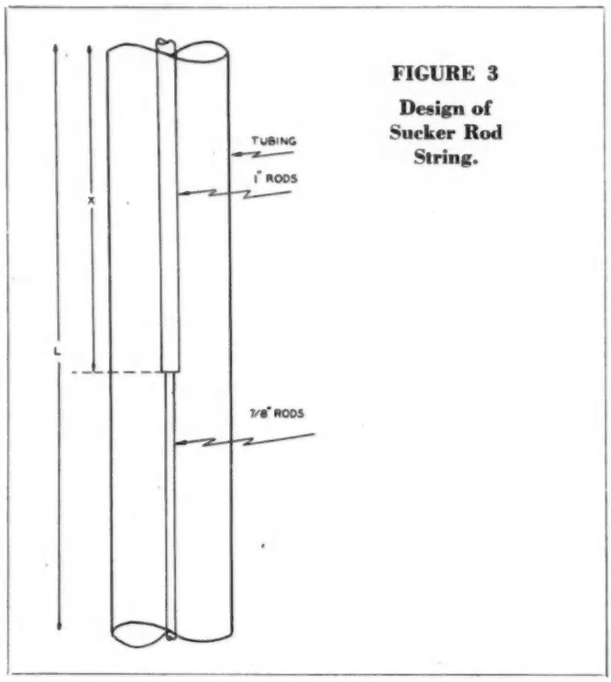


FIGURE 3
Design of Sucker Rod String.

conditions of operation are those where approximately equivalent polished rod and plunger travel are obtained. With the aid of this chart, the selection of a pump (for this well) that will give approximately the same polished rod and plunger strokes can easily be determined. For example, the chart shows that each of the three lengths of pumping strokes has equivalent plunger and polished rod travel between the dotted parallel lines designating the 2½-inch and 2¼-inch diameter plunger. For instance, the 54-inch polished rod stroke produces a 54-inch plunger stroke approximately on the dotted line designating the 2½-inch plunger. The 64-inch polished rod stroke has a plunger travel of 64 inches just above the dotted line for the 2½-inch plunger and the 74-inch polished rod stroke produces an equivalent plunger stroke approximately half way between the parallel lines. Therefore, the optimum pump selection lies with either a 2½-inch or 2¼-inch plunger.

A further corroboration of the selection of either a 2½-inch or 2¼-inch diameter plunger may be seen from the load curves plotted on the left hand side of the chart. These curves show that a minimum load is obtained between the lines designating the two sizes of plungers.

After the selection of an optimum size plunger, the selection of a normal speed of operation is then made. This procedure involves an adequate rotational speed and length of pumping stroke which will maintain the desired pump displacement with the lowest possible polished rod load. Referring to the chart, Figure 2, an optimum normal operation may be selected as shown by the examples included.

Sucker Rod String Design Procedure

The design of a rod string should consider two fundamental factors: namely, (1) the proper diameter and lengths of sucker rods and (2) the most economical type of material.

Several different means [4, 5] are used for designing a rod string which are based on an arbitrarily selected stress limit. After the primary length of sections of the various sizes of rods that compose the string have been determined, an adjustment must be made by trial and error methods. Perhaps the safest method is to design the strings so that the *unit stress* on the *top* rod in each size section is the same. The operation of the well should then be such that the working stress upon the rods does not exceed the endurance limit for that particular size and type of rod used.

Continuing the example, the following data is given:

2½" Plunger area = 4.91 sq. in.
Wt. of fluid (W_f) = (4.91 — .78) × .434 × 4050 = 7250 lbs.
Length of rod string (L) = 5050'
Desired footage of 1" rod (x) =
Area of 1" rods (a_1) = .785 sq. in.
Area of ⅞" rods (a_2) = .601 sq. in.
Unit Wt. of small rods W_{r2} = 2.16 lbs./ft.
Unit Wt. of large rods W_{r2} = 2.88 lbs./ft.

Procedure:

1. Find the unit stress upon the top rod of the small section. This is equivalent to the weight of the fluid column plus the weight of the small section of rods multiplied by the acceleration factor and divided by the cross-sectional area of the small rods; Thus:

$$\frac{[W_f + W_{r2}\ (L-x)]\ C}{a_2}$$

2. The unit stress upon the top rod at the large section is:

$$\frac{[W_f + W_{r2}\ (L-x) + W_{r1}x]\ C}{a_1}$$

3. Equating these unit stresses, the acceleration factor "C" may be eliminated and the following equation may be obtained:

$$\frac{W_f + W_{r2}\,(L-x)}{a_2} = \frac{W_f + W_{r2}\,(L-x) + W_{r1}\,X}{a_1}$$

Substituting the values,

$$\frac{7250+2.16 \cdot 4050 - 2.16\,x}{.601} = \frac{7250+2.16 \cdot 4050 - 2.16X+2.88\,x}{.785}$$

Solving for x:

$$3.53\,x = 20800 - 16000 = 4800$$
$$x = \frac{4800}{3.53} = 1360 \text{ or } 1350' \text{ of } 1" \text{ rods}$$

Then the number of feet of ⅞-inch rods should be
4050 — 1350 = 2700'

Thus, following the example through, it may be seen that a 2½-inch plunger operated at a depth of 4050 feet would require a tapered string of 1350 feet of 1-inch and 2700 feet of ⅞-inch sucker rods.

After properly designing a rod string as to size, it is then necessary to select a sucker rod material capable of withstanding the applied working loads under the fluid conditions of the well. It has been determined through laboratory tests and practical field experience, that certain alloys can withstand higher loads under corrosive conditions than other types of steel (such as the plain carbon steel.) As an aid in the selection of proper types of sucker rods for the various wells, tests have been conducted in the laboratory to determine the limitations of the various sizes and types of commercial sucker rod steels on the market.[6] While these tests are by no

[*Continued on page 42*]

A Decade of East Texas: Colossus of Oil

FACTS and fancies, sworn and foresworn, concerning the world's largest oil field reveal near unbelievable proportions. Big enough in area to cover metropolitan Houston, Dallas, San Antonio and Austin, as well as the municipalities of El Paso, Beaumont, Port Arthur and Tyler, and still with room enough left over for a four-lane highway around the field. Too big for the oil industry; too big for Texas; almost too big for the national government at Washington.

At its peak, this one oil field produced three-fifths of Texas oil, three-eighths of United States production, and 22 percent of the worlds crude output.

In its wake came "hot oil," military occupation and martial law; 2½-cent crude; proration; spacing Rule 37, more excepted than sustained; a federal tender board, being the sole such unit and functioning only in the East Texas field; an ocean of salt water; all this and more pressing hard on the discovery of oildom's long-sought ideal field offering in one sand shallow oil, easy drilling, tremendous acreage and high potentials.

HAD Mrs. Daisy Bradford's farm in the Juan Ximines Survey of Rusk County been situated a scant ¼-mile east of where it sprawled across red clay hills and dipped into winding valleys, it is highly probable that the oil industry would have been spared its East Texas field headache, or at least that the day of discovery would have been indefinitely postponed by the completion of Daisy Bradford 3 as Rusk County's seventeenth dry hole in search of the Woodbine sand.

For Columbus Marion "Dad" Joiner's selection of Mrs. Bradford's 975-acre farm as site for his thrice-begun discovery well was about two miles southeast of Geologist A. D. Lloyd's choice of a spot whereon to drill for the shoreline structure of the Woodbine sand against the Sabine uplift. To Mrs. Bradford's farm went the honor because it could be leased in its entirety only by assuming a drilling obligation.

Begun in 1927, with two old boilers, a derrick fashioned from hand-hewn timbers, and a crew recruited from the locality, at each of the first two locations stuck pipe caused abandonment of tests, and the actual location of the third and successful well is reported to have been made by John Joiner in the summer of 1930, during the absence of his father on another of the many financial scouting trips so necessary to keep flowing even a trickle of funds for operating expenses.

So desultory and intermittent was the drilling of the third test that one major company's scout, keeping routine tab on the operation, visited the lease over a score of times, and on one occasion only found the boilers warm—indicating comparatively recent activity—but never any drilling in progress. Another scout, noting oil shows in the shale pit, and checking them against his knowledge of Van crude, also produced from Woodbine sand, jumped to the conclusion that the well, like some gold mines, had been salted to make it attractive to potential investors.

Actually known for a producer early in September — dates cited are the third, fifth, eighth and eleventh, according to various authorities and fading memories — title troubles were cured and another 60-day extension secured from the Bradford family before the necessary crowd of spectators could be assembled for a test on that memorable morning of October 9, 1930.

Washing of drilling mud with clear water, then repeated swabbings, failed to bring a flow of crude to confirm the shows of oil noted on the last core taken, and the long hours, darkness and hunger had begun to decimate the crowd before the first streaks of oil were detected in the bailings. In quick succession Dad Joiner had a well, a lawsuit and a receivership; East Texas had the modest beginning of the world's biggest oil field; and the oil industry had laid upon its shoulders a task which taxed its every resource.

Judge Brown Saves Joiner's Stake

Judge Roy Bean's famous "Law West of the Pecos," and the decisions handed down there with perhaps more basis on human right than legal writ, finds parallel in the suit brought by C. M. Joiner to protect his holdings after the discovery well was finally completed. Creditors pressed him for settlements, assignments, or any other tangible assets with which

East Texas Big in Operators, Wells and Production

(Statistics as of end of year)

	No. of Operators	No. of Wells	Annual Production	Cumulative Production
1930	....	.....	27,220	27,220
1931	....	.....	109,561,000	109,588,220
1932	....	.....	121,449,000	231,037,220
1933	....	.....	204,954,000	435,991,220
1934	....	.....	181,540,000	617,531,220
1935	....	.....	176,859,000	794,390,220
1936	1,070	21,947	167,512,000	961,902,220
1937	1,016	24,094	170,673,000	1,132,575,220
1938	1,005	25,683	152,116,000	1,284,691,220
1939	980	25,786	145,469,000	1,430,160,220
1940 (July 31)	996	27,670	84,708,000	1,514,868,220

to reduce his indebtedness. Suits were filed, piling high in the courts at Henderson, seat of Rusk County, and threatening to tie Joiner's hands at least too long to enable him to organize and begin actual selling of the oil he had discovered.

Only through establishment of a voluntary receivership could he be protected. Suit to set up this safeguard was fought bitterly by the creditors, each of whom sought preferred action. Judge Brown, before whom many of the suits were heard, listened to arguments from counsel on both sides, finally summing up his findings by stating, "I feel that when it takes a man 3½ years to find a baby that he should be allowed to nurse it for a while," and the receivership was granted.

Under the receivership, leases were farmed out, oil from the discovery well sold to nearby drilling rigs for fuel, and the tangled financial affairs cleared to allow Joiner a small but remunerative share in the great field which he brought in. An interesting sidelight on the leasing activity which preceded and followed completion of Daisy Bradford 3 is that of the leases secured by both John Joiner and Tex Lloyd, sons respectively of the discoverer and his geologist, not one proved unproductive.

Had Lloyd's original location for the test, some two miles northwest of Mrs. Bradford's farm, been chosen, it is highly probable that the field would have had a different early history. For Lloyd had chosen a spot which lay directly over the "big middle" which carries some hundred feet of productive sand as compared to the scanty eight of broken formation penetrated by the discovery bit. Instead of a puny, pulsating flow that little more than lubricated the crown block, there would have been brought in a roaring, spouting gusher capable of some 40,000 barrels per day, and such a well, even in country despised and rejected by their geologists and exploration crews, would inevitably have brought widespread and immediate participation by major companies, with possibly a reduction in the driblet leasing which today gives the field a total of 1105 operators on the 133,986 acres listed as being actively producing through the more than 25,000 wells carried as producers. Had the majors been early and pre-eminent in the field, it is probable that some type of unit operation, already proven in the Van field, would have been applied to East Texas' vast underground resources, with eventual conservation of both crude and pressure.

By the time the majors had awakened to the possibilities of the field, and began the lease play which eventually gave them command of a majority of the acres in the field, the small companies, operating on from 0.099 acres up, had been established firmly, and were producing oil from their tiny plots in an unending supply which defied, and still defies, laws of hydraulics and established petroleum engineering.

With the Joiner discovery producing only a comparatively small volume, little interest attached to two other early wildcats, rank wildcats in oil field experience as then known. Nine miles separated the discovery well from the nearer test, Bateman-Crim 1, completed on December 28, 1930, as a belated Christmas present to Mrs. Lou Della Crim and promoter Ed Bateman and his associates. Almost another 10 miles away, nearly in prolongation of the straight line joining the two "discovery wells," lay the site chosen for Farrell et al's Lathrop 1. This second test, a rank wildcat in general scouting opinion, came in for the largest well yet on January 26, 1931, and established what appeared to be a chain of Woodbine producing pools over nearly 20 miles of area formerly defined as dry.

Thus, within the short space of three and one half months, prolific Woodbine sand had been found over nearly half of the eventual length of the great East Texas field—again setting a record for rapidity of extension development in any field or area in oil history.

One of the black spots on the *Nation's Business* maps of trade conditions throughout 1930 and most of 1931, East Texas was the lone white spot in December of that year, and for the months of February, March and April of 1932 was the sole white spot in the entire United States, showing in the shaded area, and never again in the solid black, until the map feature of the magazine was discontinued early in 1933. When the maps were resumed in 1934, East Texas was again in a white area, and held its own in that favored territory as the nation as a whole swung back toward prosperity and normal conditions.

So Big!

So big that a difference of 24,000,000 barrels in estimated cumulative production recovery, as reported by various authoritative sources, represents little more than one percent of its accumulated output. The East Texas field in its first decade has produced approximately 1,540,000,000 barrels of crude. Thus, this 10-year-old "child" has produced more oil than any other field in the nation regardless of age. For nearly nine years its daily output has hovered near the 500,000,000-barrel level, and, to use race-track terminology, this has been under the most stringent "wraps" known. No other area in the nation has experienced such heavy proration. Consider for the moment that wells capable of producing 800 barrels hourly are pinched to 40-odd barrels daily. Today the average daily output of an East Texas well is slightly in excess of 20 barrels, and has been for several years.

A billion and a half barrels of crude is such a staggering amount that it is difficult to picture. The great field, 42.84 miles long and 12.49 miles across from east to west, would require a wall 16 inches in height around its borders to hold the accumulated production as a pool, assuming the area of the field to be an absolutely flat surface. Or, were Gregg County to be leveled and converted into a vast above-ground storage pit for oil already produced, it would be covered throughout its area with 12½ inches of oil, with prospects of the depth being increased to nearly 40 inches before the vast resources of the field finally became exhausted.

The tremendous quantity of oil produced in East Texas by no means finishes its story of producing ability. Estimates on ultimate recovery of the field range from 4,000,000,000 to 5,000,000,000 barrels, thus the field has yielded but slightly in excess of one-third of the oil contained in its reservoir. A reserve of 3,000,000,000 barrels remaining is so big that it exceeds the quantity credited to Oklahoma, Kansas, Arkansas and New Mexico combined.

In area, its 134,000 acres are so large that they exceed the limits of seven of the nation's big fields.

East Texas has more than one-fourth of all the present produc-

ing wells in Texas, which exceeds the total existing in Kansas. It has five times as many wells as Louisiana, nearly twice the number in California. Texas, Oklahoma and Pennsylvania are the only states having more producing wells than this one field.

A Giant Among Fields

Ordinarily a 10,000- to 20,000-acre oil field, such as Hendrick, Hobbs, Oklahoma City, Kettleman Hills, Conroe or Yates, is considered a big field. Magnify such a field to a size 10 or 12 times greater, or put 10 or 12 such fields side by side, and you have some impression of the immense proportions of East Texas.

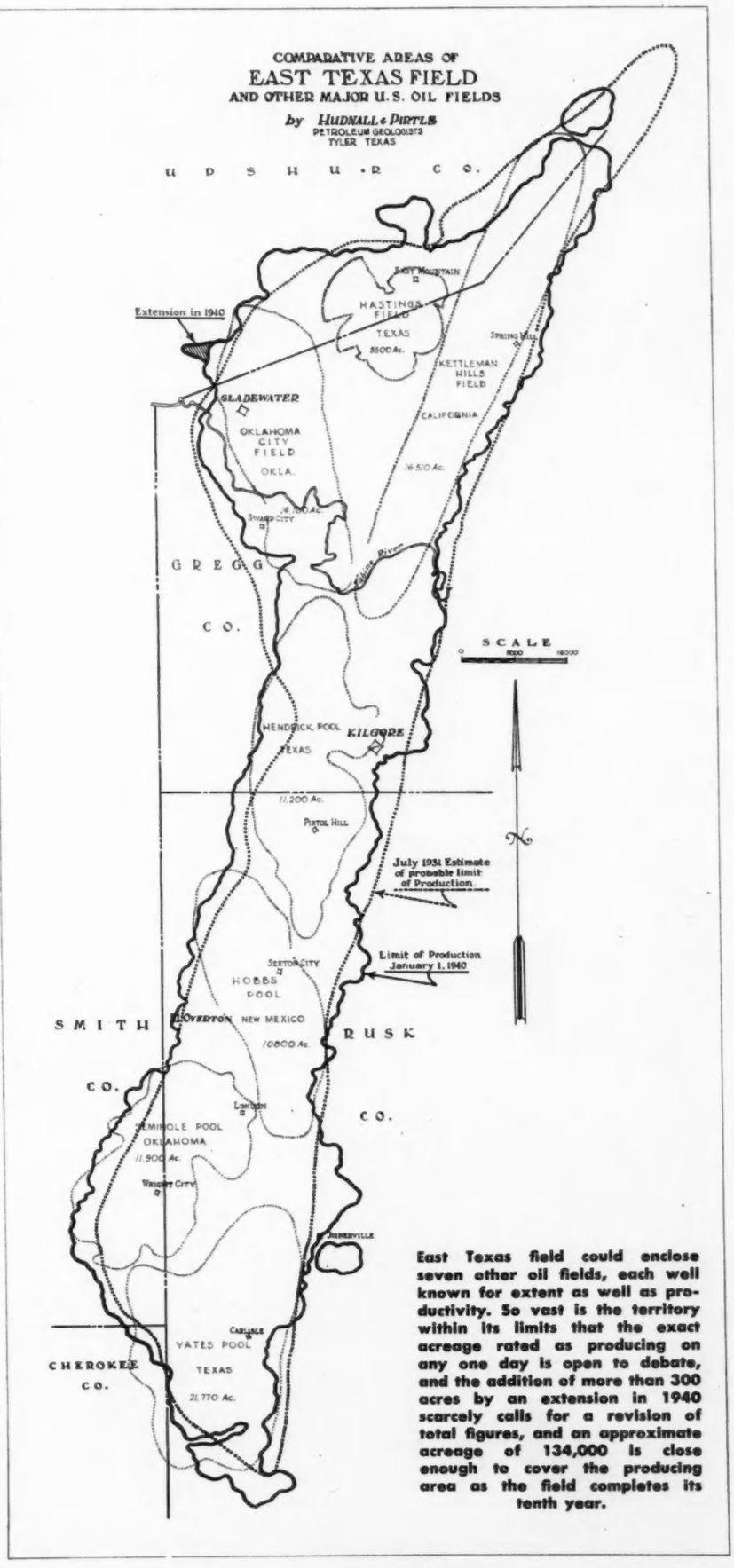
Visualize that large field as cut up into small tracts, operated by numerous companies and individuals. Magnify that image many, many times, and it is East Texas. There are over 1100 operators in East Texas. Think of two or three small refineries such as sometimes operate adjacent to an ordinary "big" field. In this case, make the mental picture 50 times as great and it would represent the East Texas refining district at its height, when approximately 100 refineries, many of "teapot" classification, were in operation.

Try to conceive the network of pipe lines above and underground in the "ordinary" field, the stock tanks, the wells. And then multiply all these by 10 or 12, to get a picture of East Texas.

Thus, East Texas is big—in fact mammoth—in production, reserves, area and wells. There remains but few other possible yardsticks for measuring the productivity of an oil field.

Finally, consider how much difficulty might be involved in controlling the ordinary large field, cut up into numerous ownerships, particularly if some of the operators were bent upon using by-passes and carrying on other underhand activities, encouraged in the meantime by ready markets and eager buyers for all contraband oil they could sneak out. Then multiply those difficulties as before, and they represent the problem of controlling East Texas that confronted conservation authorities. It is little wonder that hot oil played such a prominent part in East Texas history.

East Texas offered no drilling or producing problems, comparatively light equipment grading downward to make-shift rigs were employed. However, the influence of the field upon the industry's producing practices has been greater than any other. For it is so big and prolific


COMPARATIVE AREAS OF
EAST TEXAS FIELD
AND OTHER MAJOR U.S. OIL FIELDS
by HUDNALL & PIPPLE
PETROLEUM GEOLOGISTS
TYLER TEXAS
U P S H U R C O.
Extension in 1940
HASTINGS FIELD TEXAS 3500 Ac.
KETTLEMAN HILLS FIELD
CALIFORNIA
16,510 Ac.
GLADEWATER
OKLAHOMA CITY FIELD OKLA.
GREGG CO.
SCALE
HENDRICK POOL TEXAS
KILGORE
11,200 Ac.
PISTOL HILL
July 1931 Estimate of probable limit of Production
Limit of Production January 1, 1940
SEXTON CITY
HOBBS POOL NEW MEXICO
10800 Ac.
OVERTON
SMITH CO.
RUSK CO.
SEMINOLE POOL OKLAHOMA
11,900 Ac.
LONGVIEW
WRIGHT CITY
HENDERSON
CARLISLE
YATES POOL TEXAS
21,770 Ac.
CHEROKEE CO.
East Texas field could enclose seven other oil fields, each well known for extent as well as productivity. So vast is the territory within its limits that the exact acreage rated as producing on any one day is open to debate, and the addition of more than 300 acres by an extension in 1940 scarcely calls for a revision of total figures, and an approximate acreage of 134,000 is close enough to cover the producing area as the field completes its tenth year.

At Left: Daisy Bradford 3, C. M. Joiner's discovery for the East Texas field, with "Big Joe" and "Little Joe," the mismated boilers, nearly lost in the fringe of woods behind the derrick. Cleared spaces around the well, a day earlier, were thronged by 10,000 eager visitors, agog to see a new field brought in, and even the prolonged swabbing, which at 10 o'clock brought success to the venture, failed to discourage the more optimistic. Ground immediately surrounding the well is still black from the spray of crude which barely cleared the crown block when flow was finally established.

Below: First steps of a giant oil field. Bateman-Crim 1, now owned by Humble Oil & Refining Company, is surrounded by six developments within six weeks of the time the discovery for the Kilgore sector is brought in. Earlier wood derricks are already being supplanted by the more easily moved, more quickly erected steel units and already the two-boiler steam generating set-up is becoming popular. Drilling time is cut to less than one week as drilling equipment goes streamlined early in the field's history.

At Right: Discovery well of the Longview area, Lathrop 1, brought in January 26, 1931, for an estimated daily production of over 17,000 barrels. Typical East Texas terrain surrounds this test, which proved more than nine miles of leases between it and Bateman-Crim 1 to the south.

Below: A wedge out of the middle of the world's greatest oil field. Lease data on the area covered by this aerial survey show that upwards of 5000 derricks should be visible, with some of the leases bearing completions finished for portable servicing units. Were the area developed as closely as incorporated Kilgore, the view would include more than 45,000 derricks.

raphs on this and opposite page by Lloyd M. Long, Dallas.

it can make or break the markets. This was true nine years ago, and is still true today.

Moreover, it brought proration to the industry. While various fields had been curtailed previously, East Texas was so large it caused all fields in the nation to be prorated if they amounted to a "hill of beans." Furthermore, this is as true today as nine years ago.

East Texas has demonstrated the importance of proper well spacing early in the life of an area. Granting exceptions to spacing regulations eventually resulted in low-well allowables at East Texas. Since that time conservation authorities in Texas and elsewhere have been very careful to avoid letting drilling campaigns get out of hand.

East Texas has made the industry conscious of the value of controlling bottom-hole pressures. It has been demonstrated time and time again that the output of the East Texas field has a direct bearing on reservoir pressures. When too much oil is taken from the producing formations, pressure drops sharply and many wells go on the pump immediately. Curtail these wells sufficiently and the bottom-hole pressure will increase.

So, although it used cheap equipment, East Texas has contributed heavily to the industry's operating technique, by boosting well spacing and bottom-hole pressure control. These influences will be felt through the decades to come.

The East Texas Sweepstakes

Holders of winning tickets included nearly everybody concerned —except the oil industry. One railroad, for example, spent upwards of $2,000,000 to enlarge its facilities to handle the tremendous volume of traffic forced on it, traffic which more than paid its way for every mile hauled and ton moved. Then it turned around and leased its right-of-way through the field, and already has recovered in the neighborhood of $500,000 in royalties—with the field not a third depleted. The railroad stands to get nearly all its additional investment directly back in royalties from the field which it enlarged to serve.

Another big winner is the state of Texas. The Sabine River, but little more than a watering place for cattle during ten months of the year, manages to edge within the classification of navigable streams and thus make the state owner and potential lessee of its bed. That it has successfully done so is evidenced by the tidy sum, estimated

Thus does the state honor the discovery well which ushered in the largest oil field of the world—not even the date on the marker agrees with generally accepted "birthday," and weeds are cut only when the switcher feels the urge.

at nearly $6,000,000, which the state has already realized from its oil holdings, and which sum it stands to treble or better during the life of the field.

Gregg County, 32 percent of its entire acreage underlain by oil, made so many significant gains that they can best be grasped by tabulation:

	1930	1940	Percent Increase
Tax valuation	$5,654,000	$105,533,390	1,866.6
Population	15,778	57,934	367.2
School population	5,853	15,805	270.3
School valuation (taxable)	8,000,000	140,853,433	1,761.5
Bank Deposits	12/31/29	9/1/40	
Longview	1,508,228	8,327,163	552.1
Kilgore	150,000	3,250,000	2,166.6
Postal Receipts			
Longview	27,599	110,455	400.2

Motorists and truckers profit by East Texas' road building program, as well as indirectly through augmented gasoline tax paid in from increased driving over the good roads provided. The four counties in which lies most of the gigantic field show the following mileage of new roads, metalled, asphalt or concrete unless otherwise indicated, all built in the decade of 1930-40:

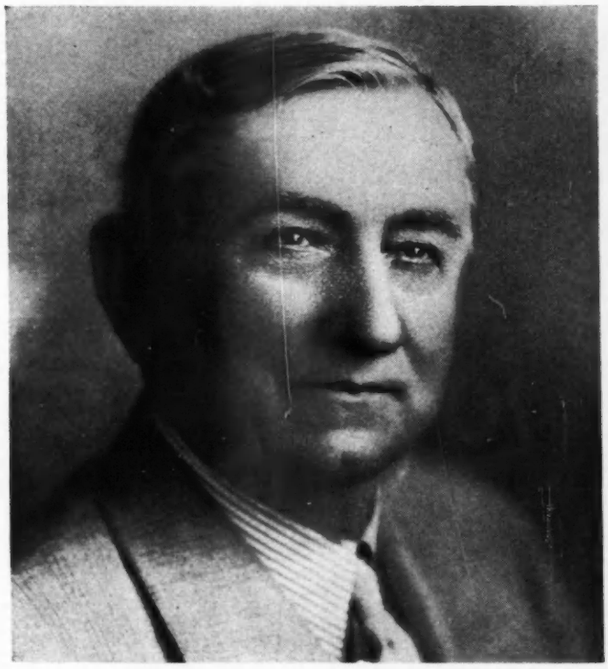
County	County Roads	State Highways
Smith	35	78
Rusk	195	127
Upshur	60	32
Gregg	163	64
(oiled)	261	..
TOTAL	714	301
GRAND TOTAL		1,015

Electric power facilities in the field have jumped from about 200 Kva in 1930 to more than 25,000 in 1940, with 475 miles of high-tension transmission lines strung to provide power for the field operations. This tremendous expansion of electric systems made economical power available to the switcher, farmer and small landholder of the East Texas field area before the federal government worked out the plan which eventually bore fruit as the REA and made it easy for the rural home owner to enjoy central station power. An instance of this expansion in current demand appears when the number of users in 1930, a total of 2806, is compared with the present total of 13,051 customers in the communities of Longview, Kilgore, Henderson, Gladewater, Gilmer and Joinerville, which profited most by the influx of citizens depending upon the oil field for employment.

Present Governor W. Lee O'Daniel, credited with originating the band scheme for attracting, and possibly, holding crowds, merely borrowed the idea from early East Texas promoters. As one then regarded highly speculative well was spudded, twin bands vied with each other for attention, and so completely filled the day that stock-selling spellbinders were forced to concentrate their efforts on individual buttonholing of likely prospects. Incidentally, each of the "suckers" thus harangued and lauded into investing realized profits up to 1000 percent on his initial investment within a year.

A family of three Easterners, leisurely touring the Southwest, stopped off at Longview for a glimpse of the new field, and were taken in tow by an active salesman for a speculative drilling company. His sales talk, coupled with the air of overnight fortunes in oil, charmed a $100 dollar contribution from each of the trio, each purchasing one share in the well. Once stockholders, it was impossible to get away from the site, and within a week the unwilling investors had turned their shares at a profit of $900 each, and were on their way to complete their sightseeing tour.

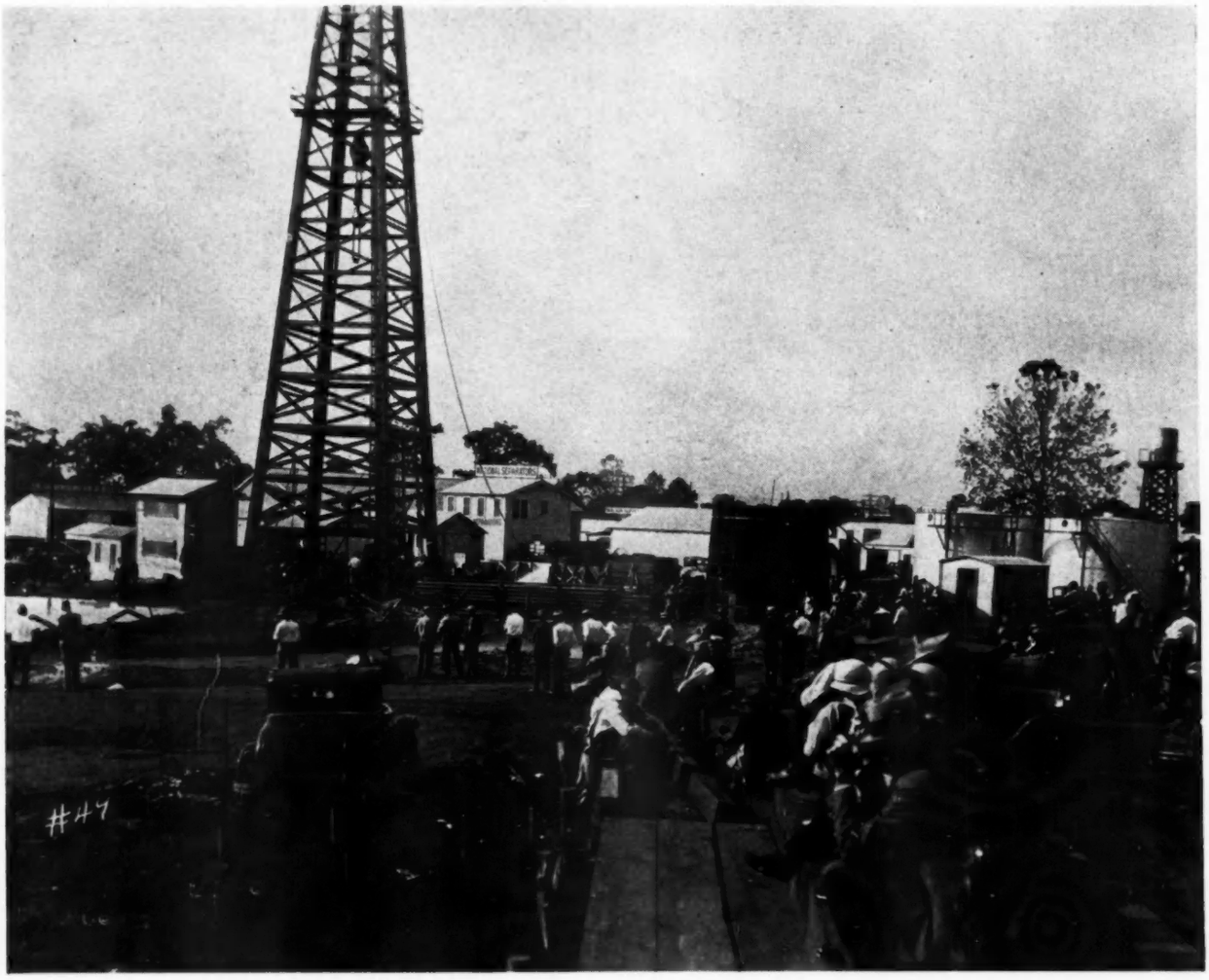
Another outsider in the early '20's, buying worthless East Texas hill land at a few cents an acre for a horticultural experiment, leased part of his holdings at what he considered an excellent rate when nearest production was seven miles away, but with a caution born of earlier experiences in other



C. M. "Dad" Joiner, oil operator whose failure to hit the Seminole field in Oklahoma twice seemed doomed to duplication in his East Texas search for the Woodbine, which, proven productive at Van, was believed to pinch out somewhere in Gregg and Rusk counties. His Daisy Bradford 3, rated around 300 barrels per day from 3592 feet, barely escaped missing the shoreline of the Woodbine altogether, as locations 1000 feet east were dry. In common with many investors, scientists and discoverers, "Dad" Joiner lived to see others grow fabulously rich from his pioneering, without himself reaping the fortune his efforts merited.

Mrs. Lou Della Crim, whose 915-acre farm saw the Bateman-Crim 1, discovery of the supposed Kilgore "pool," expand in all directions until the lease now has 188 producing wells, with an accumulated production for the first ten years of the field in excess of 14,250,000 barrels. Being owner of the field's largest single lease has not changed "Mamma Lou Della," as she is affectionately known in and around Kilgore, and her increased income has but widened the scope of her many benefactions.

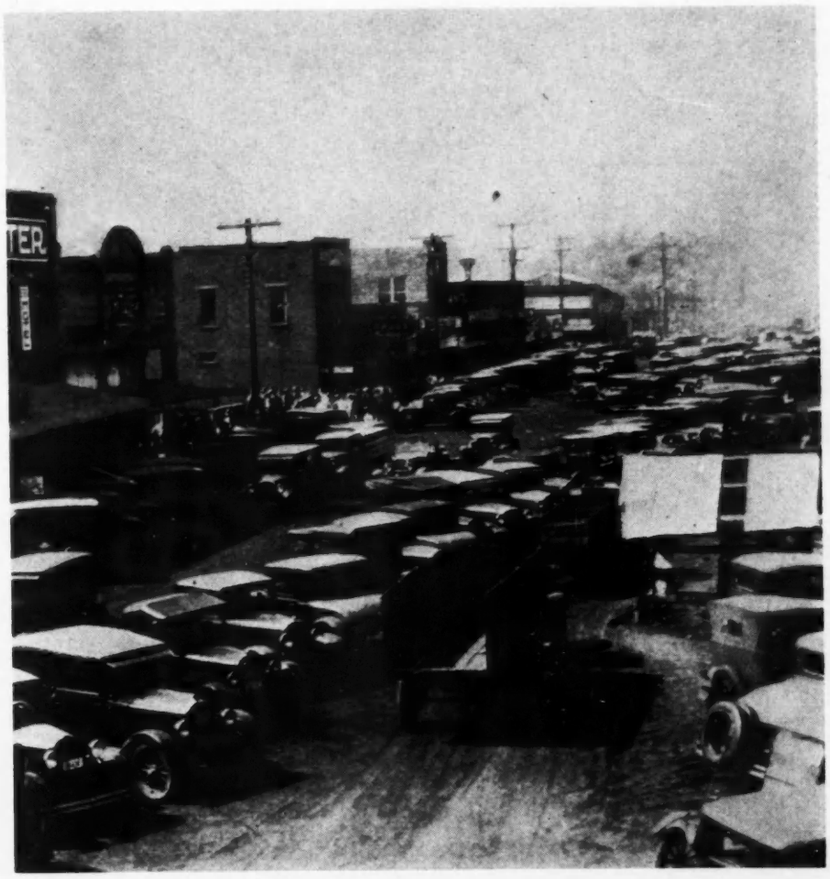
A. D. "Ol' Doc" Lloyd, geologist whose "I told you so" about the location of Woodbine production in East Texas occasioned more geologists' red faces than any other similar incident in the history of oil. "Doc" Lloyd, geologist working with "Dad" Joiner, chose a site afterwards proven to be right in the middle of the Joiner area of the great field, but reluctantly gave ground when lease advantages settled first exploration on the Bradford acreage.



Kilgore becomes an oil producing center as the first well within the corporate limits reaches to the Woodbine sand. By the time exploration had reached the city limits, practically all the larger oil field supply houses had representation in what was then believed to be three closely related fields. The wooden derrick is one grade better than the hand-hewn structures employed in earlier exploration.

Commerce Street, Kilgore, so named in the good old days because it flanked the main line of the town's only railroad, quickly lived up to and beyond its name when oil field supplies began to move in and tax every resource for their expeditious handling. Here, too, after the press of materials subsided, the lease hound was followed by the driller, and the railroad cuts coupons and draws royalty checks like any other landlord in the oil-bearing district.

Business row in Kilgore during the summer of 1931, with the old well which formerly served as town water supply still visible under the corrugated iron shelter. Many of the buildings lining this street have since been demolished to make way for slush pits, rigs and derricks as town-lot drilling placed high values on land and none on buildings.



Below is Kilgore ten years after oil was first discovered beneath 700 of the 1038 acres in the original incorporated area. "Supply Row," flanking the railroad at the left, now extends deeper into the city, with modern homes, fine stores, theatres and other commercial buildings topped by more than 500 derricks. Kilgore boasts that every street within its city limits is paved—with oil revenue—and shows an average of one well per each 1⅔ acres of its now expanded total area.

How are the mighty fallen! Four four-inch lines, spewing roaring streams of oil as one of the wells in the "big middle" is brought in, show for a production estimated well over 36,000 barrels per day. Now, under proration, this once mighty giant delivers a daily stint of exactly 36 barrels per each 24 hours it is permitted to flow. So large was the output of this well that the gauging stick, to the left of the four torrents, was drowned and the pit overflowed before the master gate could be closed and the well shut in pending tankage.

fields, checkerboarded his leasing, retaining alternate 40-acre blocks for himself. As a result of his early leases, and subsequent operations in the field he was in the position later of paying himself royalty for oil he purchased through another producer from his land.

One small lease, strategically located where three offsets could be drilled to compete with adjoining tracts, changed hands five times before a rig was finally set up on it—to drill one of the few dry inside holes in the entire field. Sold again, this time on a scrap basis, instead of pulling casing the new owner plugged back and recompleted for a producer, again sold, and not until after adjacent territory had all gone dry was it learned that the "recompletion" consisted of whipstocking and milling a window in the casing of the original hole about half way down to the Woodbine, and then deflecting the hole cannily onto a lease which had already proved its productiveness. In official statements, the hole was reported to have been "straightened" and recompleted.

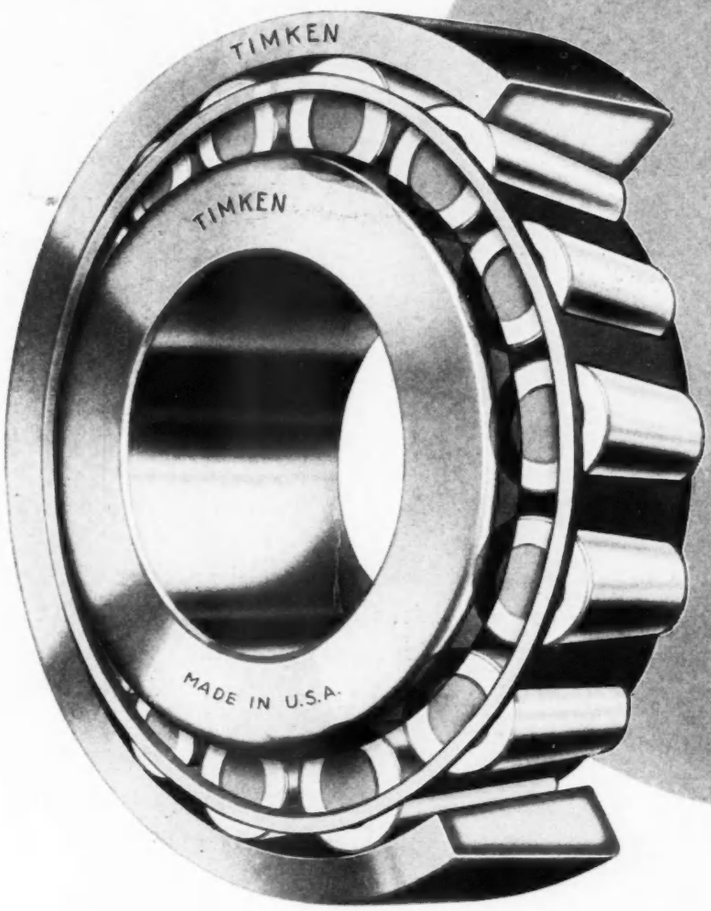
Rivalling Joiner's three-year struggle to produce oil in East Texas is the eventual turn of fortune's wheel which brought wildcatter and promoter Frank Foster, his first oil well in 42 tries.

Everybody Goes Into the Oil Business

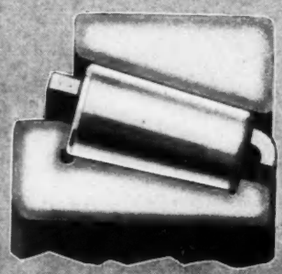
East Texas put into the oil business not only many would-be promoters, but also benevolent and fraternal organizations, burial societies (mostly colored), churches, cemeteries, railroads, school districts, and other governing and regulatory bodies, including even the Texas Game, Fish & Oyster Commission, which was forced to become an active salvage agent to prevent pollution of streams by waste oil, set free to find escape down the nearest available watercourse. Dams erected by the commission, and equipped with the usual chained log-boom skimmers, arrested much oil which was later condemned as "fugitive" oil under Texas Railroad Commission rules, confiscated by the state, and sold to the highest bidder at public auction.

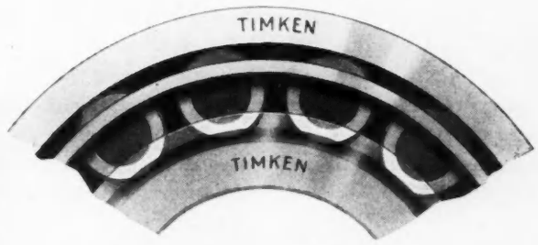
Instances are on record wherein a producer is reported to have "lost" much illicit production down a stream, later purchasing it at auction from the state and thus establishing legal title to the crude, after which it could be provided with the required tender and marketed in direct competition with regularly produced crude from wells which were being operated

The TIMKEN *Bearing of Today*



WITH 42 YEARS OF DEVELOPMENT BEHIND IT . . .





THESE X-ray pictures show the highly-refined TIMKEN Bearing of today—with all of the vitally important improvements that have been made since Timken introduced the first TIMKEN Bearing 42 years ago. Such improvements as *positive roller alignment* through wide-area contact of roller ends with the undercut rib of the cone; the *one-piece multiple-perforated cage* which assures dead-accurate spacing of the rollers around the periphery of the bearing; TIMKEN Electric Furnace Alloy Steel for supreme strength and endurance; and TIMKEN Bearing finish —the finest finish known to modern bearing science.

The consummation of these improvements has resulted in the highest quality and most efficient tapered roller bearings ever produced—with performance that is correspondingly outstanding; all designated by the trade-mark "TIMKEN" stamped on the cone and cup of every TIMKEN Bearing.

It will pay you well to make sure that every piece of machinery you buy is Timken Bearing Equipped.

Manufacturers of TIMKEN Tapered Roller Bearings for automobiles, motor trucks, railroad cars and locomotives and all kinds of industrial machinery; TIMKEN Alloy Steels and Carbon and Alloy Seamless Tubing; and TIMKEN Rock Bits.

TIMKEN
TAPERED ROLLER BEARINGS

THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

Superior

GAS AND OIL ENGINES TO GENERATE CURRENT FOR PUMPING WITH MOTORS

Particularly economical for a large number of part time or shallow, light pumping wells, due to flexibility as well as low operating cost. Equipment can be moved easily, where production has short life.

No more need for special operator or stand-by unit in stations equipped with SUPERIOR slow-speed engines than with the large number of engines of same type on geared or bandwheel powers.

Single Cylinder Horizontal 2-Cycle Gas Engines

from 10 kw. to 50 kw. Can be skid mounted also radiator cooled for quick installation and moving. The simplicity and ruggedness of slow-speed engines are particularly suitable for small properties. No skilled operator needed. Same as any other heavy duty pumping engine excepting has special equipment to give close speed regulation for generator service. Convertible to oil.

Twin Cylinder Horizontal 2-Cycle Gas Engines

up to 125 kw. for single unit or multiple unit stations operating in parallel. Heavy flywheels, hydraulic relay type governor and special mixing valve for close regulation. Extreme simplicity and reliability of horizontal slow-speed engine design. Convertible to oil.

Vertical 2-Cycle Medium-Speed Gas Engines

from 20 kw. up to 150 kw. Can be skid mounted and radiator cooled. Either belted or direct coupled generator.

Vertical 4-Cycle Convertible Diesel and Gas Engines

in a wide range of ratings for generators up to 600 kw.; in high-speed, medium-speed and slow-speed models for all applications up to largest oil field central stations. Can be skid mounted and radiator cooled up to 225 kw.

DOMESTIC

EXECUTIVE OFFICES
PITTSBURGH, PENNA.

•

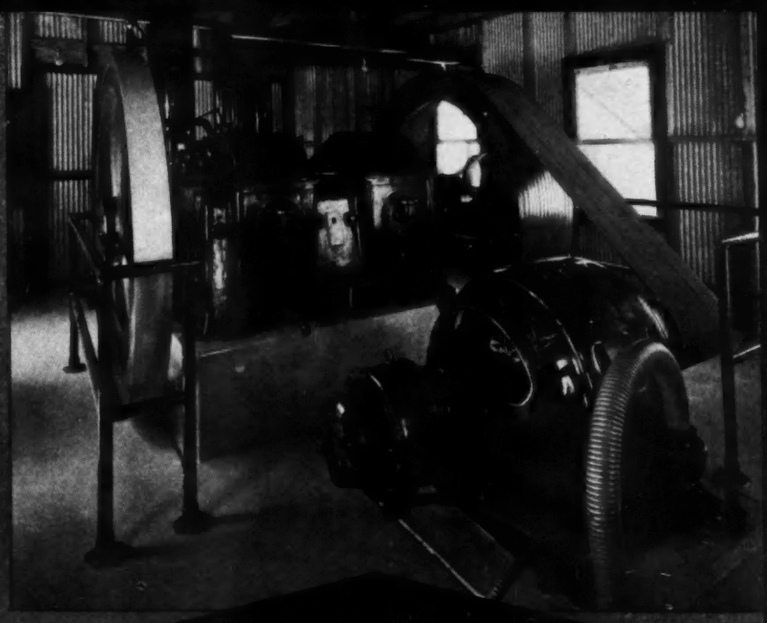
GENERAL SALES OFFICE
TOLEDO, OHIO

•

DIVISION OFFICES
FT. WORTH, TEX. • TULSA, OKLA.
TORRANCE, CALIF.

THE NATIONAL

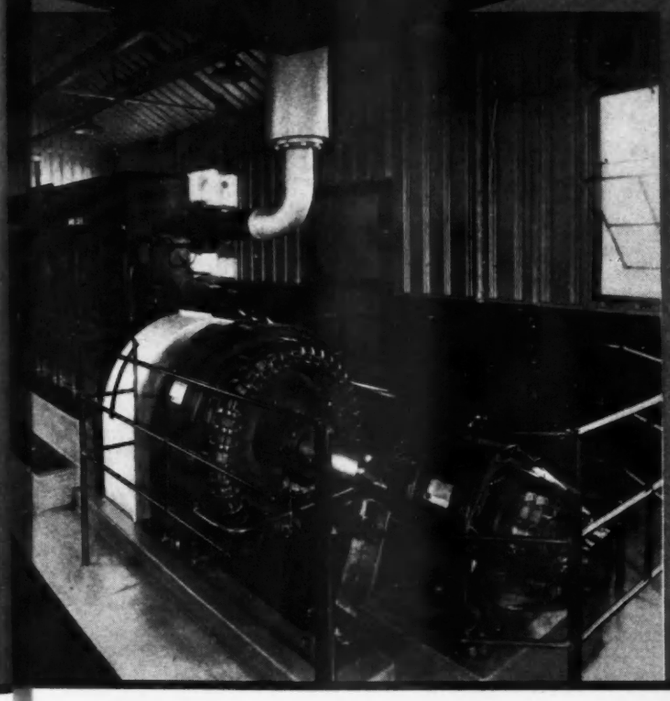
Horizontal single cylinder engine. Skid mounted, radiator cooled. In Illinois. 40 kw. generator.

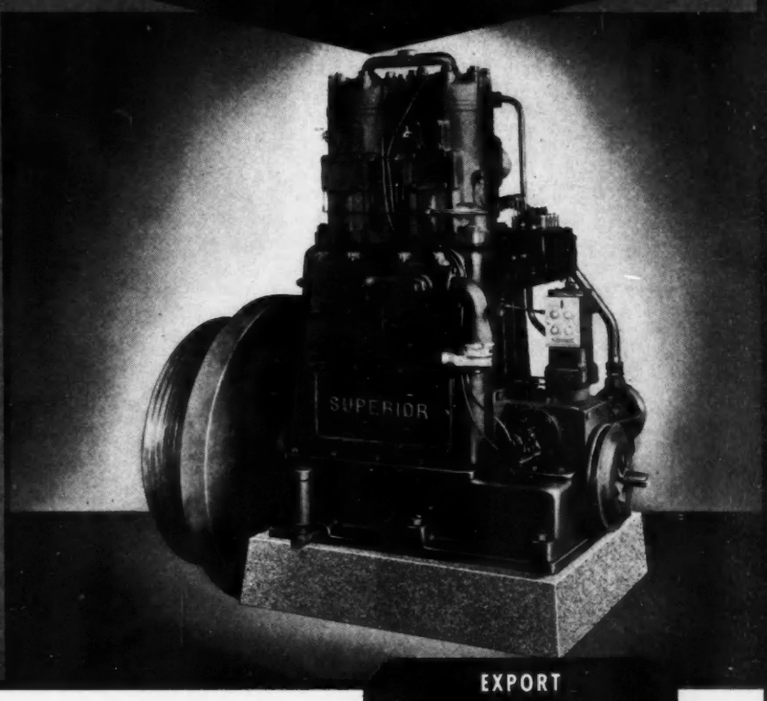


Horizontal twin cylinder engine. In Texas Gulf Coast field. 125 kw. generator.

350 H. P. Diesel direct connected to 312 kva. generator in North Texas field.

Shop view of vertical twin cylinder engine which drives 35 kw. generator. Note hydraulic relay governor.





ONAL SUPPLY COMPANY

EXPORT

THE NATIONAL SUPPLY CORPORATION
30 ROCKEFELLER PLAZA
NEW YORK, N. Y. . . . U. S. A.

•

RIVER PLATE HOUSE
12 SO. PLACE, LONDON, E. C. 2
LIMITED LIABILITY

•

PLOESTI, ROUMANIA

•

MARACAIBO, VENEZUELA

The winter of 1930-31 is still spoken of in East Texas as "the Winter it rained," and all the roads which had sufficed for farm traffic failed, became quagmires, and resigned in favor of trails across fields or on corduroy bases. "Cats," mules, ox teams and even anchored trucks with successive winch lines served to drag material not over, but through, the roads. A section of the Kilgore-Overton "highway."

in strict compliance with the commission's orders.

Refusal of the Federal Tender Board, first of its kind to be set up by the national government to regulate an oil field, to clear this so-called "blessed" oil after a state clearance had been granted through the auction sale, gradually forced this weathered and generally low-grade crude into the tea-kettle type of refineries only, which were usually simple skimming plants, and unfitted to cope with a crude of lower gravity than that represented by East Texas when freshly flowed.

Confiscated oil, seized by the state as illegally produced, amounted to over 2,800,000 barrels—more than the total production of many small pools, nearly a million barrels more than the entire oil production of Texas from 1543 through 1900, and exceeding the entire production of the Corpus Christi district through 1930.

The East Texas field saw the last of an institution which aided Texas and the other western states in maintaining law and order. Vigilantes completely organized and equipped with modern arms, at one time patrolled portions of the field and kept to a minimum the destruction of tanks, pipe lines and other producing equipment during a period while state government, notoriously a laggard, strove to gear itself for control of the great field.

Expanding hourly under the tremendous development inaugurated by proving of more than 20 miles of territory when the original Joiner, Kilgore and Longview (or Lathrop) pools were accepted as lying within one giant field, production expanded at a pace limited only by available means for storing or shipping the flood of crude being run. With one day's output passing the 1,250,000-barrel mark, demoralization of the industry, senseless dissipation of a priceless natural resource, and the general attitude of "getting mine before the other fellow gets his," so overwhelmed all attempts at regulation that the landowners and the far-seeing among the producers petitioned the governor for aid in restoring order and sane production.

Military occupation, already pioneered in by neighboring Oklahoma, was resorted to by Governor Ross Sterling when all other means of control failed, and the field was effectively and completely shut in August 17, 1931, for the first time since initial production was discovered. For a field located in what was still considered the "Wild West" by many Easterners, and with a population influx variously estimated at from 30,000 to 50,000, the reign of martial law was remarkably quiet. True, one misguided, or mis-liquored, citizen did careen madly through one of the militia camps, firing wildly at tents and soldiers at each swerve of his transportation, but no damage other than a slightly ruffled morale was suffered.

Many harmless pranks were played on some of the armed guards, but little illicit oil flowed the first day, with practically complete shut-off obtained thereafter until the field was opened under proration 19 days later. There is the story told of one militiaman, totally ignorant of oil field procedure and equipment, who was posted as guard over a certain well, and who indulged in a prolonged siesta while on duty, only to awaken and find himself confronted by three wells where but one had been. Investigation showed that two Christmas trees, identical with the one on the real well, had been planted on the lease, though the reason back of the move was never uncovered.

Other outposts in wooded sections were harassed by nocturnal rock-throwers, brush fires and smudges, but the issuance of shot guns in place of the standard army rifle greatly aided the effective marksmanship of the soldiers, and made hazing vastly more hazardous. One trooper, on lease patrol and finding the shadows menacing, posted himself atop the sole "tall 500" which provided the lease with tankage, to resume watch from there, only to be disturbed, and effectively marooned, when the tank ladder crashed and left him sixteen feet above ground.

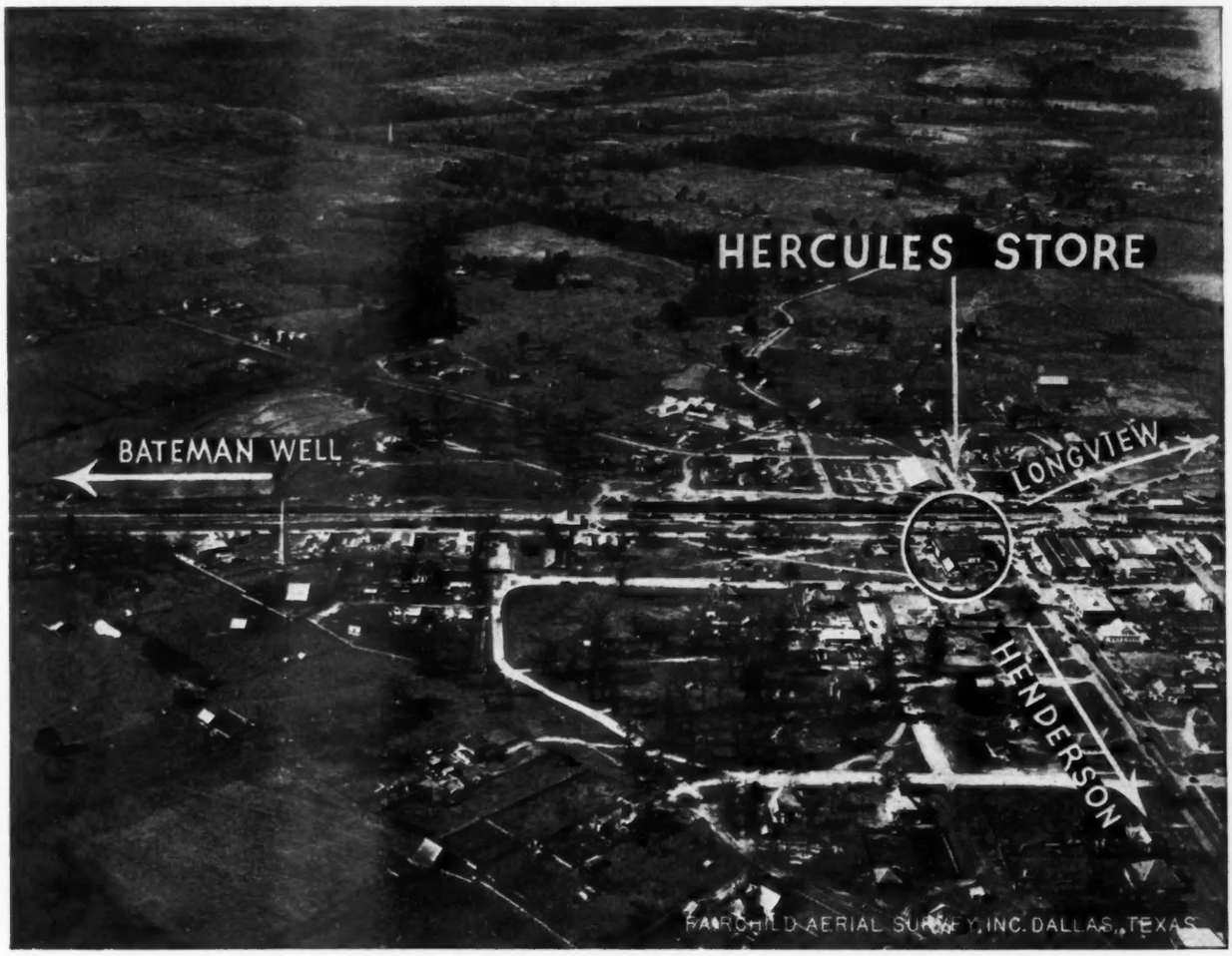
Magic in Juggling Wells and Production

Trick wells which would do most anything but produce straight gasoline were developed. One producer, either accidentally or intentionally, most opportunely ruptured the casing of his first well opposite a non-productive sand less than half way down to the producing Woodbine, and struck (?) oil when his second hole reached this sand. Although production checked exactly with crude from the Woodbine, exploitation of this freak sand was continued for several months before being finally halted by the Texas Railroad Commission. Investigation finally revealed that casing in at least one well completed in the Woodbine had been shot with nitroglycerin opposite the shallow sand, and was undoubtedly assisting in maintaining a crude supply for the shallow wells.

Another enterprising producer, closing in the first well on his lease "to cure titles," spudded in wells on either side of the initial hole, proceeding with drilling operations

From the Beginning . . .

WE HAVE BELIEVED IN KILGORE



The above photograph was taken in January, 1931, and the engraving, just as it is, appeared in an advertisement in The Oil Weekly over our signature on February 27, 1931. It showed Hercules as the first supply store in Kilgore.

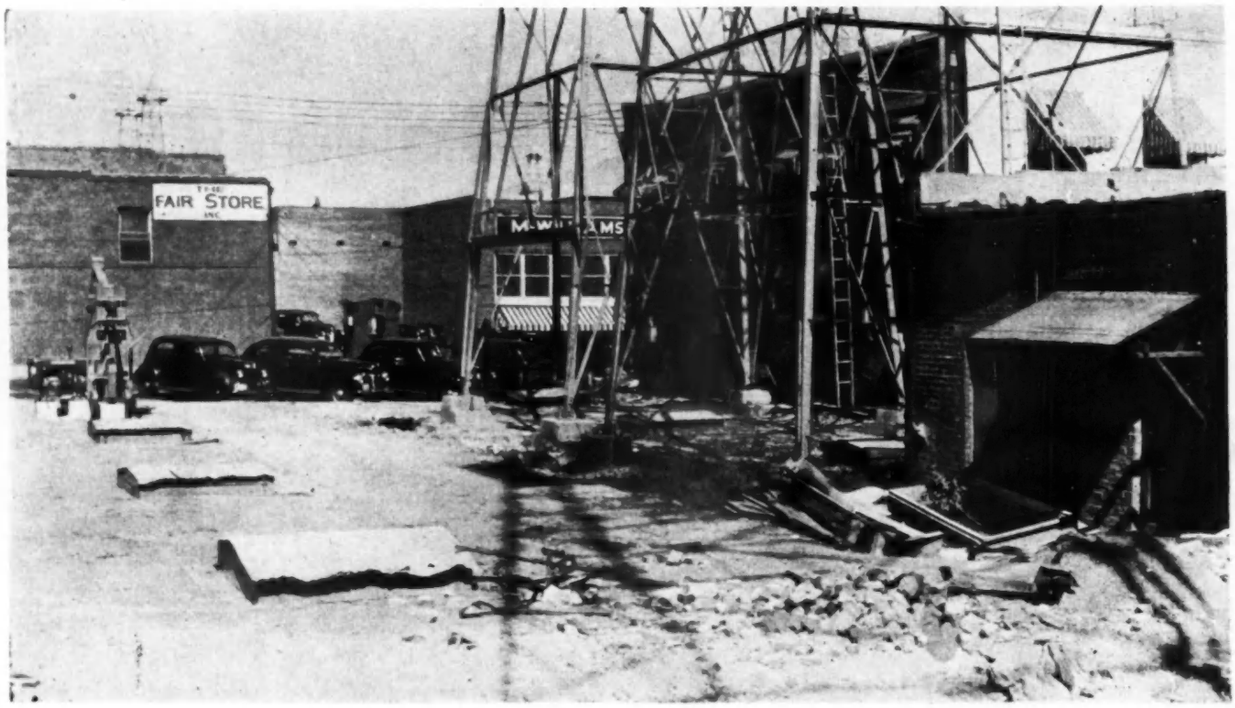
The Hercules Supply Company is proud of its early linking of interests with Kilgore just as it is proud of its long and friendly associations in this remarkable city. Now, as then, you can get quick and dependable oil field service at the Hercules Store.

HERCULES SUPPLY COMPANY

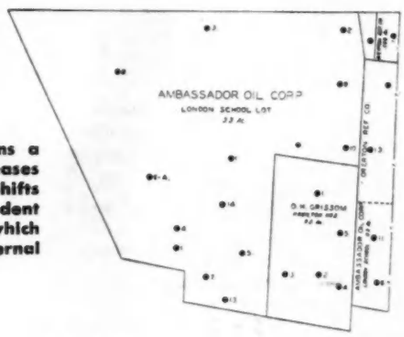
General Office:
FT. WORTH, TEXAS

J·T·McCARTHY JR
EVERYTHING FOR OIL WELLS

Branches in
PRINCIPAL OIL FIELDS



Three small corrguated iron penthouses in the open, three more under the derricks, mark a well concentration of 60 per acre, with a (theoretical) sand depth of over one mile if they produce from lease area only, throughout the probable field life.



This tiny plot, shown in the sketch, embracing 3.89 acres, more or less, sustains a mere 26 wells, in six separate leases. Operators' names on some of these small leases change so rapidly that even the monthly proration reports fail to include all the shifts in ownership. Leases shown are among those which made the London Independent School district known as the richest of its size in the world, and income from which enabled the building of the world's largest rural school until its demolition, by internal explosion, March 18, 1937.

for the normal number of days, ultimately completing both for average producers and placing the initial well on the tank battery at the same time. Not until a disgruntled employe spoke out of turn did the authorities discover that the second and third "completions" did not extend below the surface casing, and that the elaborate "drilling" and "casing" programs carried out had been mere camouflage to mask the tying in of both dummy wells to the casing of the true producer at a point far enough below the surface to preclude discovery of the tunneling through which flow lines were carried to interlink the three holes.

By-passes were seemingly nearly as prevalent as legitimate lines, zig-zagged across other lines, and even appropriated other pipe trenches without scruple. One intricate system involved a buried line on the lease, a tie-in to a major companys 8-inch pipe line, a bridge to another main line, and a further lateral to the refinery using the oil.

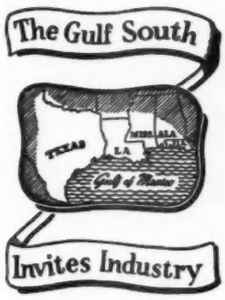
Another by-passer, working without lights in the middle of the night, missed the line he intended to tie into his hot oil source, and hooked onto a gravity gathering line of another company. An epidemic of overflowed tanks and daily production a thousand barrels over that expected led to discovery by the company whose line had been tapped—just in time to avert a feud between the hot oil producer and the refinery supposed to be purchasing the illegally run crude—each accusing the other of dishonest practices.

One by-pass, defying detection in the continued search for such lines, was betrayed by one of the infrequent snowfalls of an East Texas winter. Straight across the unbroken fields of snow lay a brown streak of bare earth—the snow melted by the warm ground overlying the pipe carrying the hot oil. Another by-pass, buried in the dead of winter across a plot planted in corn early in the spring, showed a narrow strip of green stalks which rapidly outgrew the neighboring stalks — due to the warmed soil in which the flourishing plants chanced to be.

By-pass valves were ingeniously concealed in all manner of places to elude the vigilance of commission inspectors. There is the historic instance of the small but necessary structure adjacent to the dwelling on one lease, to which the lady of the house discreetly retired on the approach of the inspectors. Finally surprising the outhouse with its door open, search revealed the by-pass valve—under the box with its one opening. A hive of bees covered one valve, a hen house another; other valves being located under shelled corn in cribs and at the bottoms of ponds, operated by long extension rods with forked ends to engage spokes of the valve wheel. One quarter-turn plug valve

★ NATURAL GAS ★

FOR DRILLING AND OTHER OIL FIELD OPERATIONS



★ Natural Gas is recognized as the ideal fuel for drilling and other oil field operations. Convenient, safe and dependable, it is always ready.

★ Our more than 6,000 miles of main transmission and gathering lines in the Gulf South make this dependable fuel available to many drilling locations throughout this area. If you are contemplating drilling or other operations in any part of this territory, we will welcome an opportunity to serve you. A call to any of our offices or employes will receive prompt attention.

Dependable Natural Gas Service Doesn't Just Happen!

UNITED GAS
PIPE LINE COMPANY

was actuated by a farm-yard gate which, swung on a two-inch pipe carried in straps on the gate post, operated to revolve the pipe through an arc when opened and at the same time through underground extension of the pipe, actuate the valve and permit oil to flow.

Most of the hot oil was run in defiance of the commission and despite the best efforts of its inspectors, but in such an organization, many of the members being political or family-tie appointees, occasional grafters turned up.

At one of the refineries, thriving on hot oil while its more law-abiding neighbors lost money on legally purchased crude, the superintendent carried a pack of cigarettes in his left vest pocket, while its mate on the right carried but two lone cigarettes. When a commission agent appeared, and was shown into the office, he was offered a smoke, which might or might not have been accepted. If, however, the commission man refused the smoke, and afterwards reconsidered, he was handed one of the two from the right pocket—which was always pocketed with the advice that "maybe it'd better be smoked later." Which was sage counsel, and never disregarded, as the cigarette contained a hundred-dollar bill, carefully folded and tightly rolled, then stuffed within the paper of a cigarette, tobacco afterwards being tamped into the ends to conceal the bribe completely.

Piracy and Peccadilloes

Theft and robbery, plain or fancy, briefed or without benefit of counsel, throve in East Texas during the early days and nights, especially the nights. Ignorant or ill-advised landowners of color were flim-flammed out of their meagre acres or saw their long-established boundaries arbitrarily moved by strange men in khaki with instruments and plats which in many instances were both bogus. One old darky, believing himself the legal purchaser and proprietor of the few acres of red and unproductive soil on which he and his brood had existed undisturbed and unchallenged for over a score of years, watched helplessly while a crew of "surveyors" criss-crossed his place with lines of stakes. As they moved off, they were succeeded by a gentleman soberly dressed in black, who assembled the family in the less cluttered of the cabin's two rooms and informed them that they were squatters and liable to immediate eviction, but that if they would all sign, or make their marks, on an imposing document which he laid before them, they would be assured undisturbed possession of the land they mistakenly believed theirs. The lease which they thus unwittingly signed generously awarded them one-twentieth of the oil produced, instead of the customary one-eighth in proven territory.

During the hot-oil period landowners stood helplessly by while unscrupulous producers stole millions of barrels of crude with wide-open lines, through devious bypasses and the use of ingenious and intricate devices. There was one valve manufacturer whose East Texas representative toured the field offering a gate valve in which the handwheel turned to the left, or counter-clockwise, to close, instead of revolving to the right. Thus, operation of the wheel ostensibly to close off the line would result in its being opened wide. Many of these valves were meticulously locked open by the agents of the commission in the belief that they were sealing off a well or tank battery.

Much ingenuity was expended in East Texas in attempting to beat governmental regulation.

Tank trucks, built with double shells and gauging wells extending through the inner and hidden compartment, enabled some refiners and truckers to conspire to haul gasoline away from the field and even out of the state, there to dispose of it without the stipulated documents proving legal origin—and, incidentally, without paying state or national tax on the gasoline. One such trucking contractor with a fleet of these double-shell trucks, it is related, ostensibly hauled cargoes of Woodbine salt water. Each truck, equipped with manifold and transverse sprinkling pipe, actually did spread a small amount of brine on the subgrade of a road. The remainder of the cargo, from the inner tank, went to power the road-building equipment, and found entrance into local trade through a string of stations.

A refiner, confronted with a stock of gasoline which could not be moved because of taint in the crude oil title, colored the gasoline with powdered charcoal, and merrily sent it on its way labelled "crude tops," on which, at the time, there was no legal restraint. An inexpensive filtering process at the receiving end, of course, removed the "tops" from the crude and again restored it to its original clarity, and usefulness as motor fuel.

Another refiner, tanks full of gasoline immobilized by state and federal restrictions, apparently became a jobber in crude oil, and set up most unusual conditions where tank cars loaded with crude were consigned to East Texas when local crude was available at less than freight rates on the "foreign" oil. Invariably this "imported" crude would later be billed to an out-of-state refinery and not refined in the East Texas plant to which it was consigned originally.

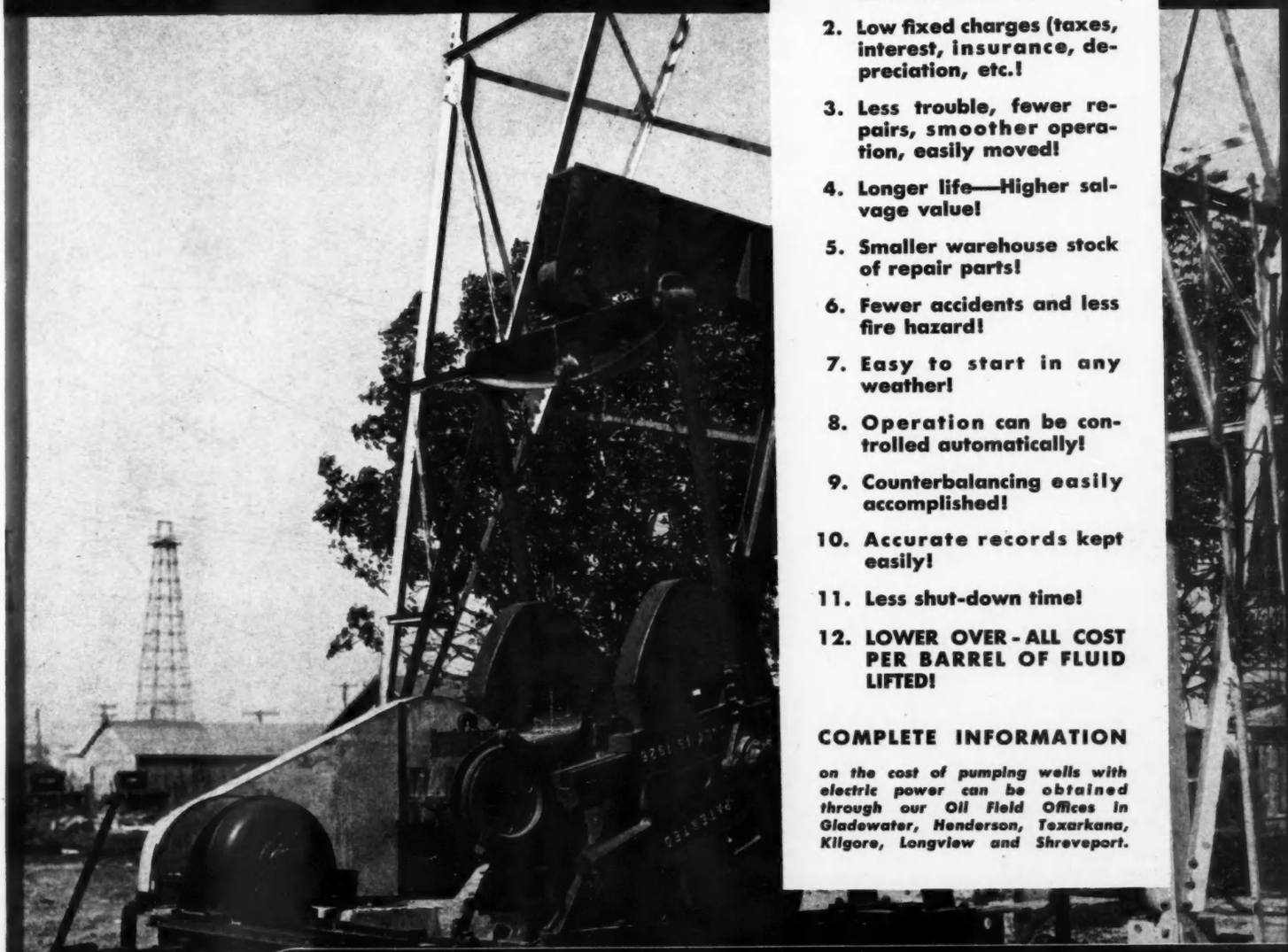
Investigation, finally set on foot to explain the anomaly, proved that the incoming tank cars were full of water. The refiner was paying freight rates on crude, draining the water, and refilling the cars—still sealed—with his gasoline, shipping it out of the state and thus gradually clearing his stocks. The profit on his otherwise unsalable gasoline, produced from hot crude and moving tax-free more than cared for the double freight rates.

One operator, during the period when injunctions could be secured against the Texas Railroad Commission to relieve distress conditions, secured such an order against the authorities to move the trifling (?) amount of nearly half a million barrels of crude. After the courts had acted on his petition, investigation disclosed that not even the tanks, supposed to be distributed through the field, were in existence, much less the oil they were alleged to contain. In this instance the dignity of the law, outraged by false affidavits, acted to nab the offender and he spent the following two years in a federal penitentiary.

False affidavits, documented falsifications and notaried nonentities paled beside the carefully worked out detail which sent a wire to the chief enforcement officer at the commission headquarters in Kilgore. The wire authorized him to approve the tender on 127,231 barrels of oil. The oil moved. So did an investigation.

Neither Austin, nor Kilgore had any record of such a message. The message, on a standard blank, had been delivered in Kilgore from Gladewater, by a former telegraph company employe, during the noon hour of the man regularly on duty there. The tender, approved and in proper outward form, was never seen by the tender board. The in-

12 REASONS WHY Purchased Electric Power is Preferred in the East Texas Oil Fields



1. Low first cost and low maintenance cost!
2. Low fixed charges (taxes, interest, insurance, depreciation, etc.!
3. Less trouble, fewer repairs, smoother operation, easily moved!
4. Longer life—Higher salvage value!
5. Smaller warehouse stock of repair parts!
6. Fewer accidents and less fire hazard!
7. Easy to start in any weather!
8. Operation can be controlled automatically!
9. Counterbalancing easily accomplished!
10. Accurate records kept easily!
11. Less shut-down time!
12. LOWER OVER-ALL COST PER BARREL OF FLUID LIFTED!

COMPLETE INFORMATION

on the cost of pumping wells with electric power can be obtained through our Oil Field Offices in Gladewater, Henderson, Texarkana, Kilgore, Longview and Shreveport.

SOUTHWESTERN
GAS & ELECTRIC COMPANY

vestigation ultimately contributed largely toward a change in enforcement personnel.

Piping Record Oil Brings New Methods

Short flumes of dressed and matched timber, last resort when pipe is unobtainable, were but little used even in the most hectic rush of early East Texas development. One of the most disastrous of the refinery fires in the field was caused by an attempt to patch such a flume, leaking oil at a seam. The spark between hammer and nail head was sufficient to start the blaze, and the resulting explosion shattered the flume, spreading blazing oil throughout the plant.

Although not using flumes extensively, due to the highly volatile nature of the crude, the field is believed to have been the first, if not the only, user of vitrified clay soil pipe, with cemented bell-and spigot-joints, for transporting oil under pressure. One such line, 2200 feet of six-inch pipe, with a wrapping of chicken wire fencing around each joint to reinforce the ball of cement formed to augment the strength of the pipe at that point, carried crude from tank battery to nearby refinery for several months, and then was supplanted by a four-inch steel line with stepped up pressures. After remaining quiet for several months, the clay pipe again carried hot oil at intervals and through the nature of its material successfully defied location by electrical or radio finders until the refinery finally succumbed to economic pressure and was dismantled. Much of the original pipe is serving to carry salt water in another portion of the field.

Working of the law of supply and demand, at the urge of necessity, is evidenced by the use of boiler tubes as oil lines. With no actual figures available, and much of the footage laid as hot oil lines with no pedigree, record or statistics, estimates of boiler tubes laid in East Texas give a conservative figure of around 100,000 feet of such emergency "pipe." The tubes, largely drawn from stores of such material left over from Emergency Fleet Corporation days, were available at cost much below line pipe. The tubes, joined by welding, proved but a troublesome makeshift, the thin-walled material, designed to withstand pressure from the outside, bulging or swelling under pump surges and eventually splitting longitudinally and causing endless trouble.

Since the boiler tubes carried mostly hot oil, however, leakage was serious only when it led to the discovery of the illegal line; while fire hazards and property damage were ignored.

East Texas pioneered in:

"Po' Man's Pennies." During the early days one major company bought oil at prices much below those paid by others in the field and steadfastly refused to meet others' postings. Finally, as a protest, half gallon fruit jars were set up throughout the field, into which workers, operators and citizens of the locality were to drop odd change, to reimburse the oil company for the loss it was assuming in buying East Texas Oil.

"Hot Oil." When oil was run in amounts greater than that allowed by the Railroad Commission, and such overage was detected by one of the inspectors, it was necessary for this to be reported by him on a standard form. In official phraseology this was: "illegal production of excess oil in violation of military orders and the rules and regulations of the Railroad Commission of the State of Texas" and such wording was supposed to appear on each complaint filed against a producer. Sergeant D. W. Johnson, of the military forces, correlating the actual temperature rise of oil when produced at a high rate of flow with the underworld use of the term "hot" to denote goods stolen or without legitimate title of ownership, denoted illegal oil as "hot oil" in his reports, this term quickly finding use throughout the field and supplanting the "bootleg oil" which had preceded it in oil field lingo.

"Phantom" Refineries and "Ghost" Pipe Lines. So vast and wide-flung were the operations in the field that subterfuges to obtain oil and materials often went for months before detection. There was one pipe line, buying and selling oil in large quantities which was finally run to earth in the basement of a hillside farm house outside of Gladewater. No office equipment, no records, no furnishings save the hats and coats of the two men who constituted the "company" and who cashed the checks in payment for oil.

One refinery, projected for a certain site, found a rival already on the ground there when first driblets of needed equipment began to arrive. So bullish was the market for such apparatus, though, that the owners of the refinery disposed of each carload as it arrived, yet at the same time set up a refinery organization and proceeded to receive, refine and distribute crude as though actually processing it.

Only a step behind the enterprising owners of the phantom refinery was the builder and first operator of one of the so-called "teakettle" plants dotting the East Texas landscape. When the hot oil situation threatened to scorch his fingers, he sold out, for cash. Some time later, checking with the county clerk's office at Longview, he found he still had — on the books—title to his erstwhile property. Being buttonholed while in the courthouse lobby by a man yearning to go into the refining business in East Texas, he allowed himself to be inveigled, for a price, into giving a 90-day option on the plant.

The deal was so easily consummated that temptation to repeat was irresistible. Over the next few days nearly half a dozen "options" were disposed of at from a few hundred to a thousand dollars each (payment to apply on purchase price, of course) and a thriving business was underway until the ambitious ex-owner made the mistake of approaching the brother of a man who already had bought an agreement to sell the plant.

Shades of—and Shady—Gabe Muckelroys

Hidden deep within the field lay a tract of some 50 acres, property of one Gabe Muckelroy, colored, indigent—and missing since 1917. With oil surrounding the property, Gabe Muckelroys began to appear, real, spurious, and synthetic—but none of them possessing sufficient data to prove himself the original owner of the tract.

The court at Henderson, already clogged by lease title litigation found the "Gabe" claims recurring with monotonous frequency. Finally, to clear the dockets, Judge Brown declared a "Gabe Muckelroy Week," in which all claims were to be presented and passed on. But when all claimants had finished, the Judge gave it as his decision that the original Gabe was legally deceased, and his heirs stepped in. Even now, despite the decision and a decade later, some old darky will turn up in court, in tow of a "percentage" lawyer, to plead plaintively: "Judge, Ah don' want no back oil money, Ah jes' wants mah lan'." The courts have disposed of one such claimant al-

NEW PLANT IN LONG LAKE FIELD INSTALLS INGERSOLL-RAND LVG'S

● Two 650 hp. Type LVG gas-engine compressors are the heart of this 50,000,000 cfd. plant. Gas enters the double-acting steel compressor cylinders at 1350 to 1450 lbs. and is discharged at 2150 lbs.

The LVG is the latest addition to the line of Ingersoll-Rand gas engine compressors — *the original line* of V-angle design—the line noted for reliability, economy, accessibility, ease of installation and economy of floor space and foundations.

4-cycle LVG's are the compressor choice in three of the most recently built recycling plants.

Write today for Catalog 3073 or call for an Ingersoll-Rand oil field representative.

Other I-R Products for the Oil Industry include: Cameron Pumps, Gas and Oil Engines, Air and Gas Compressors, Condensers, Air Tools, Etc.

Atlanta
Birmingham
Boston
Buffalo
Butte
Chicago
Cincinnati
Cleveland
Dallas
Denver
Detroit
Duluth
El Paso
Hartford
Houston
Kansas City
Knoxville
Los Angeles
Newark
New Orleans
New York
Philadelphia
Picher
Pittsburgh
Pottsville
Salt Lake City
San Francisco
Scranton
Seattle
St. Louis
St. Paul
Tulsa
Washington

Ingersoll-Rand

11 BROADWAY, NEW YORK CITY

949-1

ready this year, with still another claim filed for the next term of court.

Getting Well with One Well

Two thousand feet of pay sand. Figures don't lie. For proof, consider one well, sharing a lease of one twentieth of an acre with two others, each of which, prorated at 20 barrels per day, has never, for the records failed to flow that amount.

Apportioning the acreage equably between wells, each unit is entitled to 726 square feet of the lease and therefore, under the "oil in place" theory, to the crude underlying that amount of surface. Since the well flows 20 barrels of oil per day, in 6½ days it flows the equivalent of a foot of oil over the area—or a tidy amount of 56.455 vertical feet of oil per square foot of lease area over a years time, assuming that the well taps a reservoir of pure oil.

Since, however, optimistic ultimate recovery estimates for the field rarely top the 50 percent mark, and saturation seldom exceeds the 33 percent point, by combining these figures with the oil which must be secured to make production, each year's output—if secured only from sand underlying the well and on its rightful lease—would require a sand thickness of 338 feet, or approximately 2000 feet of typical Woodbine sand for the life of the well to date.

Figures still can't lie, and if the specimen well is honest and produces only from sand which it is morally entitled to drain, the ultimate life of the well, with at least 10 years' additional production forecast for its section of the field, will point to a (mathematical) sand depth in excess of 5400 feet; more than a mile of theoretical sand, which should establish a new world's record for unbroken pay sand thickness—if true.

Salt water produced with East Texas oil now approaches the oil output in gallonage, some of it being returned to the sand through wells specially drilled for such service and handling the water after treatment to remove the impurities and permit it to re-enter the sand and replace oil being produced. Other salt-water-disposal plans include construction of storage pits, usually bordering on some watercourse eventually reaching either the Sabine or the Neches river watersheds. These pits, full to the brim with salt water, are emptied during rainy periods either by the dikes being opened or the (anticipated) functioning of "act of God" sections in the dikes. These sections, of sand covered with clay to mask their instability, readily wash out during heavy rains, especially when aided by agitation supplied by a shovel in the hands of a zealous lease switcher.

Early in the life of the field the salt water problem reached such proportions that a proposal was advanced to construct a canal, 30 feet wide and carrying 3 feet of water, from the field to the Gulf Coast. Had the project been completed, and enlarged to transport maximum brine expected as the field goes more and more to salt water, only the installation of frequent passing basins and maintenance of a rigid schedule of loadings and departures would have been required to permit the flood of salt water to float barges enough to carry therein all that portion of the vast field's output which now finds its way to the coast via pipe lines and tank cars.

Even in advance of its present salt water troubles, the East Texas field suffered severely from fresh water shortage during the hectic days when as high as 866 operations were under way simultaneously (October 10, 1931) and landowners on whose acres were located the field's few ponds and lakes realized that fluids other than crude oil might be valuable. Boiler-feed water, originally free for the pumping, entered the market as a cash "crop," with prices per barrel, in place, reaching the figure of 50 cents per barrel paid by at least one operator and hauled at his expense in his own trucks to the tank on his lease. One producer, building a 3-inch water distribution main from the pump supplying water to his own drilling operations, ran laterals to adjacent leases and sold water enough, if current reports at that time be accepted at face value, to pay all expenses of laying the line, purchasing water and supplying his own rigs.

Centered in and dividing the main highway which traverses New London, this chaste memorial commemorates the tragic deaths of 455 school children and teachers of the New London school—all of whom perished in a terrific explosion caused, primarily, because a school board sought to economize on a heating plant. Through their passing all users of natural gas now live more safely, for an aroused nation and an awakened industry quickly devised and mandated odorization as a means of detecting gas leakage.

Wild Days Gone

Already, though but ten years old, the East Texas field has come of age. Gone are the days of wild wells, wild women and wild tales. In their place are ordered production, with wells held down until their massed output falls below the rate which will unduly deplete reservoir pressure; orderly communities, well provided with schools, churches and adequate housing; and so humdrum is the daily tale of the field's doings that the discovery of an extension which changed the status of over 300 acres from dry territory to where conservative opinion does not hesitate to label wells now being drilled there as semi-wildcats.

From being a gamble, a means whereby the unscrupulous could amass a fortune almost overnight, the field has become a source of steady — if reduced — income. The field workers, from a nomadic people ever alert for news of the next successful wildcat or spreading pool, have become settled, and children are in many instances already succeeding their elders in tasks which before East Texas were but a shade more stable than the ceaseless following of "public works" as a means of livelihood.

With a decade in the past, children of oil field workers have lived their entire scholastic life, and been graduated, all within the walls of a single school, and even sceptical credit managers, viewing East Texas' record, now class those in the field as credit risks equal to or surpassing one with similar incomes in other walks of life.

Truly East Texas, gigantic and all but overpowering, has brought in its train much good. May its succeeding decades be undimmed by the tragedies, the heartbreaks, which marred its first.

80 STRINGS CEMENTED—AND NOT A HITCH..

▶ **Crew working with Unaflo Oil Well Cement on the 80th string in this deep, high-pressure Louisiana field. Right through these 80 consecutive cementing operations, they've had "absolutely no cementing trouble," thanks to Unaflo.**

"DOWN here in southern Louisiana, we sure are gettin' scientific. Why, it's got so now we drill and cement these 9,000-ft. holes just like clockwork.

"Why have we been clicking along so smoothly? They say one of the reasons is that we've got rid of cementing troubles by using this Unaflo cement. And that makes sense to me. You see, this is the 80th string in a row we've cemented with Unaflo—and not a hitch!"

In this Louisiana field the drilling company used 550-750 sacks of Unaflo Oil Well cement on each of the 80 oil strings so far cemented. On each well they also used 750 sacks of Universal Atlas Portland Cement on the surface pipe, rig foundations and cellars.

If you, too, want to click along like clockwork and protect your well investment take a tip from this Louisiana field and use Unaflo, the easy-flowing, hard-setting oil well cement with the retarded set. Write today on your business letterhead for "Oil Well Cementing Guide," a new booklet on using Unaflo. Address nearest office of Universal Atlas Cement Co. (United States Steel Corporation Subsidiary), Amicable Building, Waco; Tulsa; Oklahoma City; Kansas City.

USE ATLAS HIGH-EARLY FOR FAST CEMENTING!

● *Here's the secret* of speeding up surface cementing and saving money on rig time. Atlas High-Early gains strength several times faster than regular portland cement. Use it for surface and conductor pipe and also for rig foundations and cellars. Try it for yourself—and see.

OW-H-10

UNIVERSAL ATLAS OIL WELL CEMENTS

[*Continued from page 18*]

means infallible, they are at present the best guide available and experience has shown that good service is usually received when the working loads are kept below these limitations.

Continuing the example, assume that the well considered is contaminated with hydrogen sulphide gas and produces large quantities of salt water. Since it has been decided to use a tapered string of 1-inch and 7/8-inch sucker rods, reference to the laboratory endurance limit tables (Figure 4) shows that the nickel molybdenum steel, in this size, has an endurance limit nearest to the probable working load figure of this well. Although the probable working loads will exceed this endurance limit figure, this is the best that can be done and, under the circumstances, the performance of the well should be carefully watched and any unnecessary stresses placed upon the rod string by such detrimental conditions as fluid pounds, plunger undertravel, etc., eliminated.

The Selection of Walking Beam [7]

While the responsibilities of adequate designs for a walking beam or a unit should be left strictly to the manufacturer, it is necessary to have some idea of the conditions for which adequate equipment must be selected. Continuing the example, it was shown that a maximum load of approximately 22,000 pounds may be expected under the operations which have been chosen. As shown by the accompanying diagram (Figure 5), a maximum load of 22,000 pounds occurs at the assumed horizontal position of the walking beam and a like amount occurs at the pitman. These loads are designated by the downward arrows on each end of the walking beam. The resulting upward force necessary to balance these end loads then would be 44,000 pounds and is carried by the saddle bearing on the Sampson Post. Under these conditions, the greatest shearing force would be at the center of the beam. This point would also be the position of the maximum moment and therefore must be the strongest part of the walking beam.

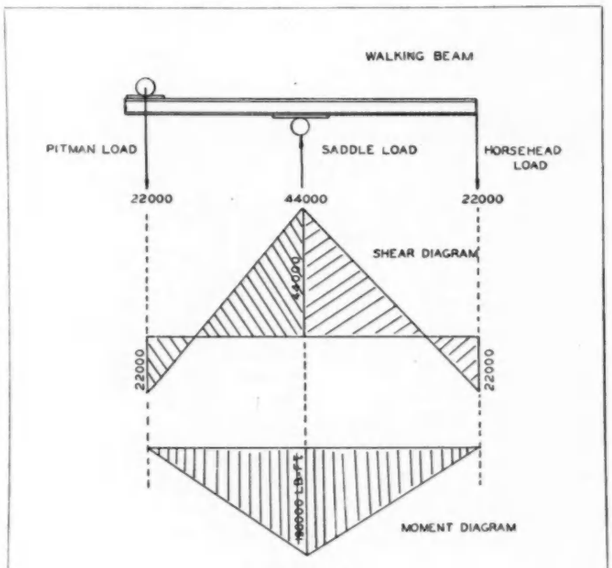


FIGURE 5
Shear and bending forces.

Considering the bending moment which the beam must carry, assume that the loads are placed at nine feet from the center of the beam. The maximum bending would then be nine times 22,000 or a bending moment of approximately 198,000 pound-feet of moment.

In order to show the relative shear and bending moments at any point on the walking beam, diagrams have been drawn. This is shown on Figure 5 by drawing straight lines from the points representing the magnitudes of these factors at the center to similar points for the ends of the beam.

Selection of Gears [8, 9]

Here again, in the selection of gears for a unit, the manufacturer (who we assume has investigated more thoroughly than the producer the adequacy of certain gears) should be allowed the responsibilities of selecting adequate equipment. On the other hand, even the manufacturer must have some idea of the conditions which his equipment is to meet and therefore a method of approximation of these conditions is desirable. It has been agreed generally that peak torque appears to be the most convenient factor to use for determining gear application of pumping wells. Torque is a twisting load imposed on a member such as a shaft—the allowable amount of which is that which the shaft will safely transmit continuously.

Continuing the example, and using our previous selection, a 64-inch stroke is in use with a 22,000 pound maximum load at the polished rod. We assume that the amount of effective counterbal-

FIGURE 4
Laboratory Endurance Limits

ROD	Endurance Limits Pounds per Square Inch		Endurance Limit in Pounds for each Rod Size			
			Size	Air	Salt Water	H_2S
Type 1 (SAE T1335)	Air	56,400	5/8"	17,300	9,030	3,710
	S. W.	29,400	3/4"	24,900	13,000	5,350
	H_2S	12,100	7/8"	33,900	17,680	7,270
	.....	.....	1"	44,300	23,080	9,500
Type 2 (Low Mn. Rod)	Air	52,600	5/8"	16,150	6,730	4,950
	S. W.	21,900	3/4"	23,250	9,700	7,120
	H_2S	16,100	7/8"	31,600	13,170	9,680
	.....	.....	1"	41,300	17,200	12,630
Type 3 (SAE 1045)	Air	51,600	5/8"	15,850	6,110	3,350
	S. W.	19,900	3/4"	22,800	8,800	4,820
	H_2S	10,900	7/8"	31,000	11,950	6,550
	.....	.....	1"	40,500	15,620	8,550
Type 5 (Wrought Iron Rod)	Air	30,400	3/4"	13,430	8,660	7,250
	S. W.	19,600	7/8"	18,260	11,780	9,860
	H_2S	16,400	....	.....	.....	.....
Type 6 (Ni.-Sil. Steel)	Air	45,100	3/4"	19,920	11,230	9,700
	S. W.	25,400	7/8"	27,100	15,250	13,170
	H_2S	21,900	1"	35,400	19,930	17,200
Type 7 (SAE 4620)	Air	52,500	5/8"	16,120	10,170	6,910
	S. W.	33,100	3/4"	23,200	14,620	9,950
	H_2S	22,500	7/8"	31,550	19,900	13,520
	.....	.....	1"	41,200	26,000	17,660

Courtesy—S. M. Jones Co.

STREAMLINED
for better performance

"Oilwell" Type "C" Slush Pump Valve Service: (1) Upper Valve Guide; (2) One-piece Valve with Insert; (3) One-piece Seat with integral Lower Guide; (4) Valve in seated position, showing lightweight construction.

"OILWELL" TYPE "C" SLUSH PUMP VALVES

HAVE you ever heard of a *streamlined* slush-pump valve? The new "Oilwell" Type "C" Valves and Seats are *streamlined* for an important reason—to reduce turbulence as in the streamlining of an automobile. This and other advanced features result in longer life, improved efficiency, lower over-all cost, and better all-around pump performance. These advantages are evidenced in actual service records. The following are outstanding construction features:

★ ***Streamlined*** . . . substantially increased fluid-passage; minimum turbulence.

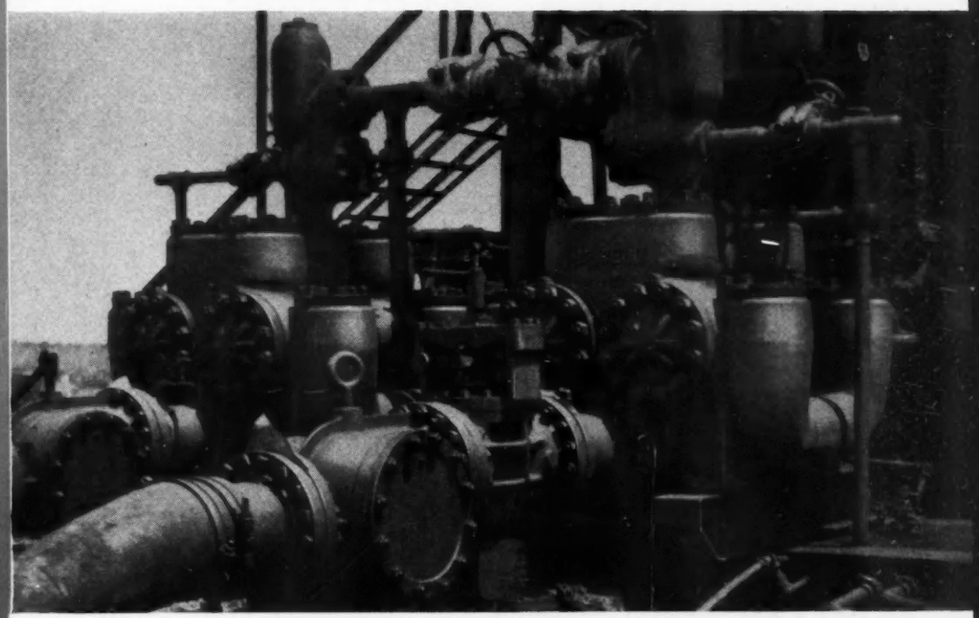
★ ***Light weight*** . . . valve lifts faster and seats with less shock.

★ ***One-piece construction, drop-forged and fully heat-treated*** . . . both valve and seat are of an alloy steel which has proved itself in slush-pump service.

★ ***Ample contact surfaces of extreme hardness*** . . . resist abrasion and shock.

★ ***Positive pressure seal*** . . . fluid pressure acting on flexible sealing ring provides positive seal. These heat- and oil-resisting sealing rings are renewable.

★ ***Non-metallic renewable guide bushings*** . . . made of flexible, heat- and oil-resisting material, minimize wear on stems and guides.



Maintain the original, efficient performance that is built into "Oilwell" and Wilson-Snyder pumps by using only genuine "Oilwell" and Wilson-Snyder replacement parts.

OIL WELL SUPPLY COMPANY

Branch Stores in all Oil Fields

Subsidiary of United States Steel Corporation

ance (either applied on the walking beam or on the crank) is 13,000 pounds. The dynamometer card has shown that a minimum load of 6000 pounds is being experienced.

The maximum possible torque is in force when the crank is at either of its two horizontal positions. Assuming that the maximum load occurs at the middle of the upstroke, and since the torque is the equivalent of force (or load) times the length of the crank arm, then using the figures shown, we have

$$(22{,}000 - 13{,}000) \times \frac{64}{2} = 9000 \times 32 = 288{,}000 \text{ in.-lbs.}$$

This final figure represents the maximum possible torque for the upstroke. An investigation of the downstroke torque may be made (by assuming a minimum load, in this case, of 6000 pounds) as follows: $(13{,}000 - 6{,}000) \times 32 = 22{,}400$ in.-lbs in which the 13,000 pound figure is the assumed effective counterbalance.

It can be seen that the torque for each horizontal position of the crank (the up or the downstroke) must be investigated as there is a possibility that the downstroke torque may be greater than the upstroke torque.

In order to illustrate why the maximum torque load occurs at the horizontal position of the crank, assume that the maximum load occurs at the beginning of the upstroke. From Figure 6, it can be seen that, although the maximum load is much greater at this position than with the crank in the middle of the stroke, the effective moment arm of the crank (which is a trigonometric function) is zero and increases as the rotation of the crank proceeds.

Selection of Prime Mover [10]

After the selection of an adequate rig front or pumping unit, a prime mover capable of supplying the motivating power must be chosen. While the type of prime mover depends upon certain factors such as fuel or power available, operating and maintenance costs, ease of installation, salvage value, adaptability, or certain operating characteristics as speed fluctuation, etc., adequate power can always be obtained and it is only necessary to determine the required size of unit.

Continuing the example, the amount of horsepower required to produce the desired amount of fluid by means of the selected equipment, may be computed as follows:

The term "hydraulic horsepower" (in this case) refers to the weight of the volume of fluid lifted the depth of the well in a unit length of time. Thus

$$\text{H.P.} = \frac{\text{Vol. of fluid in 24 hrs.}}{24 \text{ hours} \times 60 \text{ minutes}} \times \text{weight of fluid} \times \text{depth} \times \frac{1}{33000}$$

$$= \frac{600 \times 42}{24 \times 60} \times 8.35 \times 4050 \times \frac{1}{33000 \text{ ft. lbs./H.P.}}$$

$$= \frac{\frac{25200}{1440} \times 8.35 \times 4050}{33000} = 17.9 \text{ H.P. units}$$

The above calculations assume that the working fluid level is at the pump. Where there is a higher working fluid level, the lift of the fluid should be the total depth minus the height of this level above the pump.

Now allowing for such factors as friction, assumed a "hydraulic efficiency" of 80%—thus arriving at a probable polished rod horsepower of $\frac{17.9}{8}$ or 22.4.

Using this figure and an assumed rig efficiency of 75%, the total estimated horsepower requirement of the engine would be $\frac{22.4}{.75}$ or 30 units.

Summary

Thus through calculations, which have examined the probable plunger travel of various size pumps as well as the loads to be expected from these pumps, adequate sizes of sucker rods, and sufficient power requirements from surface equipment, figures have been obtained from which equipment may be safely selected for this particular well. Assumptions have been made, but these have always been on the side of safety yet still maintaining an economical status.

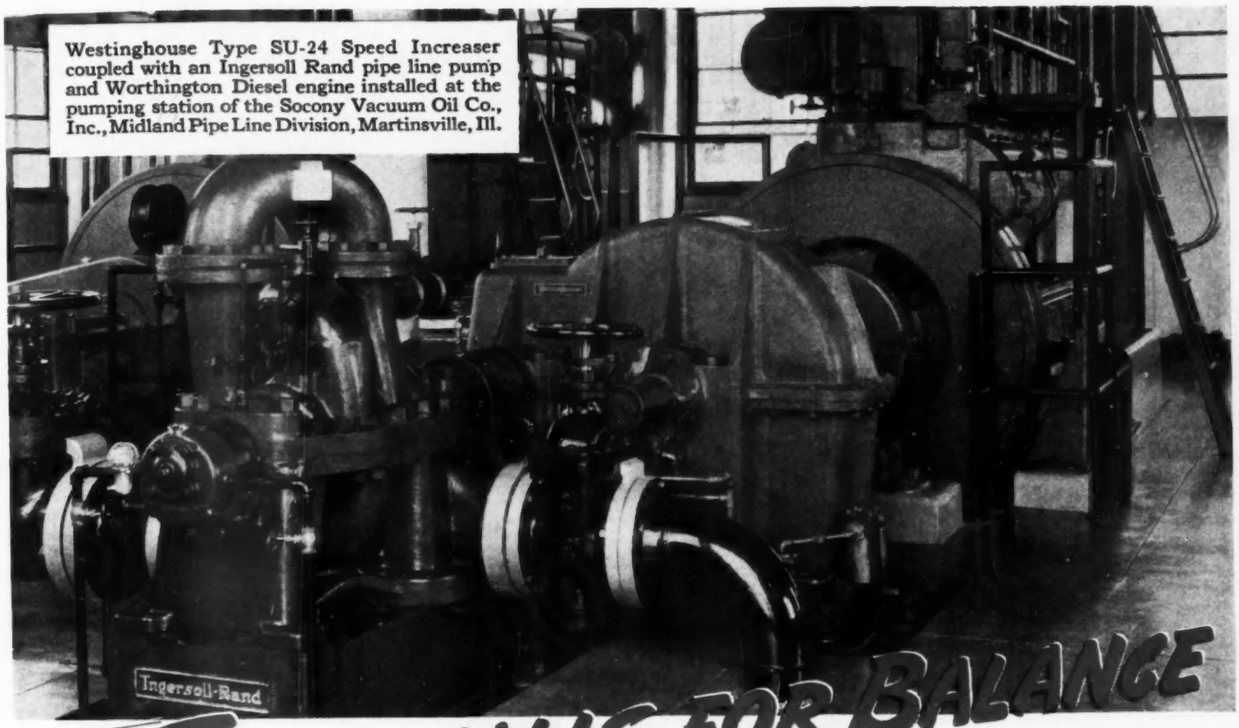
Summing up the results of the calculations in the example, a 2½-inch diameter plunger was selected to obtain the necessary plunger travel for making a desirable production of 600 barrels. An operating speed was found at which the maximum loads would be a minimum. In order to meet the prevailing corrosive and load conditions of the well, a sucker rod string composed of 1-inch and ⅞-inch sizes was selected of material of nickel molybdenum steel. The surface equipment, in order to handle the computed maximum load of 22,000 pounds must be composed of a walking beam which is capable of working satisfactorily under end loads of 22,000 pounds, a shear at the center of 44,000 pounds and a maximum bending moment of 198,000 pounds-feet. The gears in the unit must be capable of withstanding a maximum torque of 288,000 inch-pounds. The engine must be capable of putting out approximately 30 horsepower.

(To be continued)

FIGURE 6
Schematic drawing of maximum torque position.

Bibliography

[1] Eugene Hosford and Emory Kemler, "Typical Dynamometer Cards and Their Application," Drilling & Prod. Prac., Am. Petr. Inst. page 81, 1939.
[2] Robert William Rieniets, "Plunger Travel of Oilwell Pumps," Drilling & Prod. Prac., Am. Petr. Inst. page 159ff, 1937.
[3] S. B. Sargent, Jr., "Capacity Pumping of Oilwells," Drilling & Production Prac., Am. Petr. Inst. page 148ff, 1937.
[4] S. B. Sargent, Jr., "Capacity Pumping of Oilwells," Loc. Cit.
[5] Petroleum Equipment Directory, 1940, pages L-12, L-13, J-20, J-21.
[6] "Endurance Limits," Confidential Engineering Data, The S. M. Jones Co., 1938.
[7] H. W. Ramey, "The Application & Selection of Pumping Units," Parkersburg Rig & Reel Co. Publications, page 29ff, 1938.
[8] R. Griffin De La Mater, "The Application of Gear Reducers to Oilwell Pumping Service." Presented at the 23rd Annual Meeting, Am. Gear Mfgrs. Ass'n, May, 1939, page 12.
[9] H. W. Ramey, "The Application and Selection of Pumping Units," Loc. Cit., page 34ff.
[10] Petroleum Equipment Directory, 1940, pages J-24, J-25.



Westinghouse Type SU-24 Speed Increaser coupled with an Ingersoll Rand pipe line pump and Worthington Diesel engine installed at the pumping station of the Socony Vacuum Oil Co., Inc., Midland Pipe Line Division, Martinsville, Ill.

SPEED CALLS FOR BALANCE

6,000 RPM—that's the speed at which the pinion shaft in speed increasing units often turns. Vibration caused by improperly balanced gears spells trouble at any speed. That's why all gears in Westinghouse Type SU Speed Increasers are dynamically balanced on a special machine developed by the Westinghouse Research Laboratory.

Smooth, quiet operation is further assured by the accuracy with which gear teeth mesh—accuracy made possible by the hobbing process of gear cutting, the most accurate method ever developed.

The entire gear assembly in Westinghouse Type SU Speed Increasers is enclosed in an extra heavy cast-iron housing that assures permanent alignment of rotating parts and dampens external vibration. Bearings are oversize and lined with a special high-grade long wearing babbitt to hold bearing maintenance at a minimum.

And with a Westinghouse Speed Increaser there is never any danger of gears or bearings running dry. A positive pressure circulating oil system keeps every moving part properly lubricated while an oil spray is directed at the mesh line of the gears. An oil strainer keeps the lubricant free from dust and grit while a special cooler dissipates heat.

Westinghouse Electric & Mfg. Co., Dept. 7-N,
East Pittsburgh, Pa.

WRITE FOR THIS FREE BOOK

Westinghouse has prepared a special 24-page book describing Type SU Speed Increaser Units. It contains detailed specifications and helpful application data for speed increasers used with electric motor and multi-cylinder engine drives. It's free. Just ask for booklet DD-3650.

High Speed
WESTINGHOUSE
GEARED DRIVES

J-07184

Westinghouse Geared Drives

W
WESTINGHOUSE ELECTRIC

Stripper Wells Automatically Disconnected When Fluid Level Becomes Low

STRIPPER-WELL operation now includes a new tool, in the form of an automatic knock-off for rod-line pumpers. Producing properties in Muskogee, Bartlesville, Nowata, Burbank and other Mid-Continent areas have satisfactory installations. The new unit is another link in the recognized trend toward automatic operation of marginal production. Unlike many other satisfactory devices for automatically attending various phases of stripper-well production, the new unit is applied to the task of shutting a well down, not at the end of a predetermined period, but when the fluid level in the working barrel has been lowered to a certain level, regardless of the pumping time involved.

FIGURE 1

The working of the unit is entirely mechanical. The device makes use of a well-known, rod-line action to disengage the power from the well when it should no longer be operated. The impulse originates in the working barrel in combination with the reverse action of the power and is first apparent at a point near the power, and is determined by the point at which fluid is encountered.

Essentially, the device, for which patent has been applied, consists of a draw-bar connected to the rod line, with the line carrying a weight in cylindrical form constituting a trip. Directly above the rod line at this point (Figure 1) is a trigger positioned rigidly to a horizontal bar above and parallel to the rod line. The opposite end of the horizontal bar is thrust into a recess in a held plate so that the bar supports the plate. When the bar is pulled from the recess, the plate falls to the draw-bar, engages it, and the shackle falls free to knock-off the well. Figure 3 shows plate down; well disengaged.

As the action of the device depends solely upon the function of the producing well, then the equipment must be actuated by some difference between the action of a rod line pumping a loaded barrel and the same rod line when the well is about pumped down. The property of the action is the sag in the rod line due to a working barrel full of fluid as against a taut line when the level of the fluid has been reduced materially by normal producing.

The operator has often observed the action of the shackle rod line as an indication of the fluid level in the well, and the condition of the pumping equipment. The rod line alternately sags and becomes taut in accordance with the resistance of the fluid in the working barrel of the well. The proportion of sag to the full stroke of the rod line indicates the fluid level in the barrel. If the line is taut through its entire stroke, then the operator knows the well has been pumped down and that the plunger is falling free. However, if there is fluid in the well, say in half the working barrel, then the rod line sags through half its stroke. If the down stroke is all reflected in a sagging rod line, then the working barrel is completely filled with fluid.

The principle is the same as the simple pulley. If a rope is thrown over a pulley supported on a post, and a weight corresponding to the plunger is attached to the end of the rope, then a man pulling the weight up and down will notice no sag. However, if he lowers the weight into a barrel of water, then

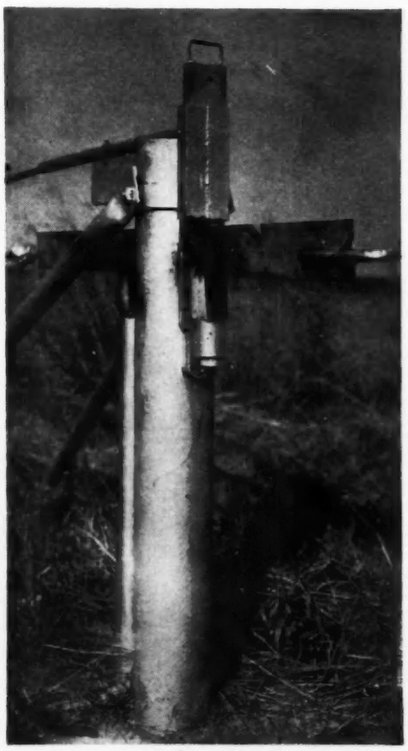


FIGURE 3

Pictured above is each of the eleven issues of The Composite Catalog from the 406-page 1929 Edition to the 2547-page 1940 Edition.

GROWING *because it serves a need*

The growth of this catalog, phenomenal as it has been, has come about directly as the result of the acceptance and recognition it has received at the hands of you oil men, who represent 98% of the domestic and 97% of the foreign producing and pipe line activity.

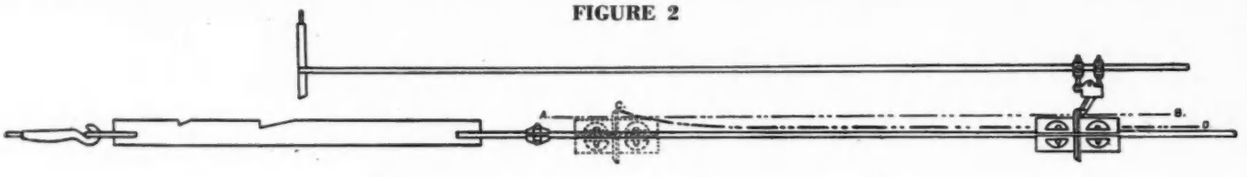
Each year the leading manufacturers have recognized your outspoken preference by taking even greater advantage of the opportunity to catalog their equipment in this accepted manner.

The Composite Catalog is truly . . . *Growing because it serves a need!*

You'll find it . . . quickly . . . in

THE COMPOSITE CATALOG

FIGURE 2



SKETCH OF MOVING PARTS, ONLY.
A-B. ROD LINE IS TAUT - FLUID LOW
C-D. SLACK PASSES WEIGHT UNDER TRIP

FIGURE 4

the weight travels less swiftly than formerly and slack or sag occurs.

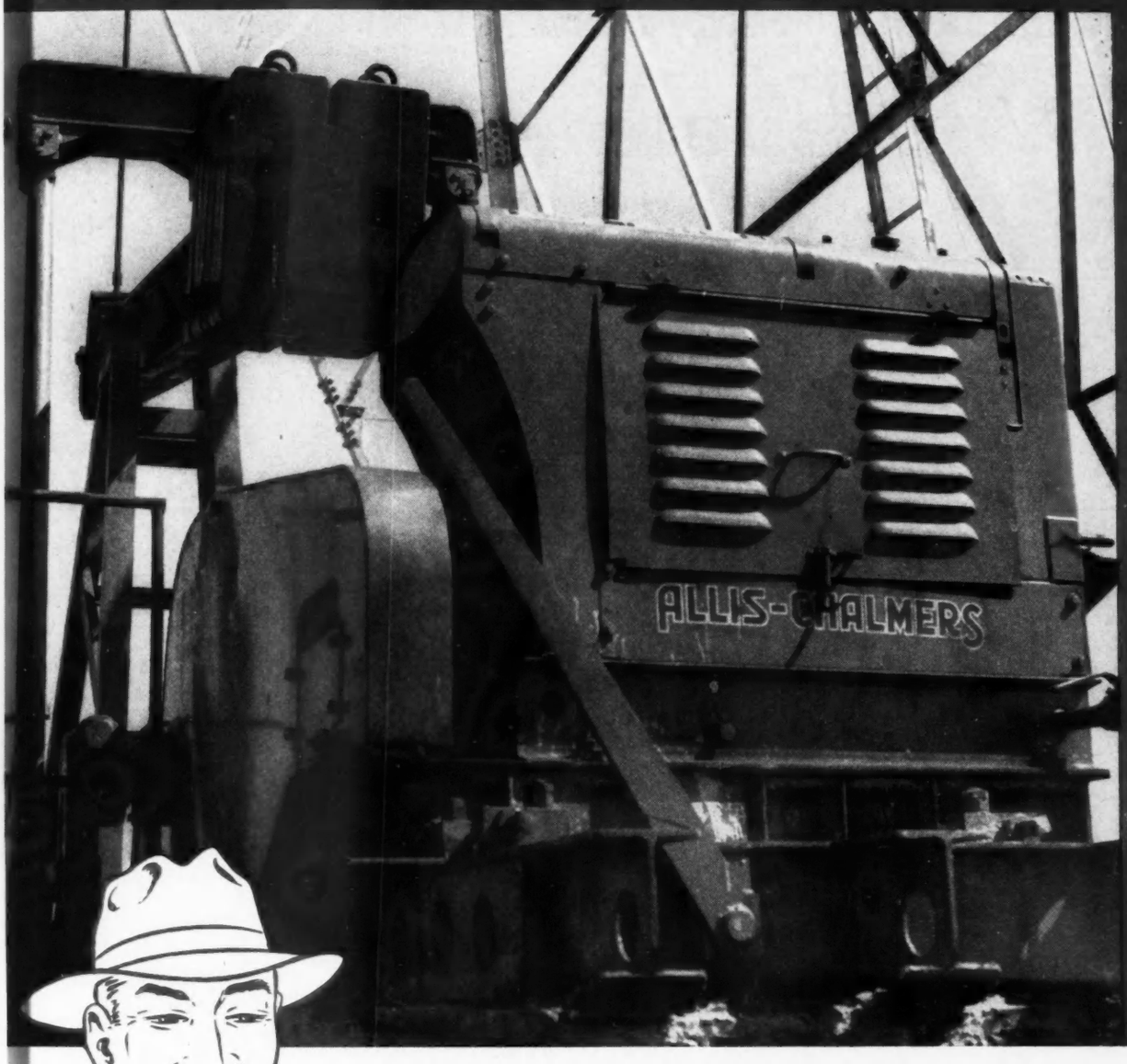
These changing points of sag are utilized in the automatic knock-off to disengage the well. How this is accomplished can be seen from Figure 4. When a well is first put on the power it is assumed the space between the traveling valve and the standing valve is full of fluid. Under such condition the mentioned resistance is present and sag is present throughout the stroke as indicated by dotted line C to D. With this sag in the line, the trip weight passes under the trigger affixed to the upper horizontal bar. However, with the sag gone due to a constant weight in the well, the trip weight follows the line A to B on the down stroke and, contacting the trigger, releases the drop plate to knock-off the well. Through adjustment of the position of the weight, or the trigger, the well may be made to knock-off at any fluid level desired.

As wells are different in producing characteristics, each installation is set and adjusted to obtain the maximum volume with economy. Once adjusted, it needs no further attention or adjustment from day to day. The well will continue to cease pumping at the same fluid level each day without regard to the number of strokes or time required to lower the fluid level to the desired point.

The well producing the least crude is the most expensive to operate per dollar of revenue. While there may still remain a considerable reserve in many stripper areas, operating expenses force discontinued operation prior to exhaustion of the formation. The automatic knock-off reduces attention required on central power installations, and consequently reduces operating overhead by a considerable amount per barrel of crude produced.

In addition to the reduction of attention, the knock-off has effectively reduced the number or frequency of work-overs by cutting a well off a power before it reaches the danger point to cups and valves. In one case, there were 14 pulling jobs in 17 months prior to the installation of the equipment. Since adaption of the knock-off in May of this year there have been no pulling jobs.

HERE'S A SMART WAY TO SQUEEZE A NICKEL!



Low cost natural gas *CAN* be the best fuel if your pumping power engines are built to burn it.

Allis-Chalmers slow speed pumping engines are regularly, furnished from the factory, equipped with a special natural gas carburetor and regulator which will assure full power and efficiency from this fuel. The average torque rating of all five sizes of A-C engines, operating on natural gas of 1,000 B.t.u. per cu. ft., is .952 as compared to the same engines operating on 70 octane gasoline at the same R.P.M.

Gas burning equipment on A-C engines provides easy starting without priming with gasoline. Governors are built-in, fly-ball type designed to suit each engine size. They are extremely sensitive and will maintain close, accurate control of the throttle at varying loads. The engines also burn gasoline and distillate.

Allis-Chalmers engines are available in the following sizes: **Model L, 590 ft. lbs. torque at 650-700 r.p.m. Model E, 375 ft. lbs. torque at 650-700 r.p.m. Model U, 200 ft. lbs. torque at 900 r.p.m. Model W, 128 ft. lbs. torque. Model B, 74 ft. lbs. torque.**

WRITE FOR COMPLETE SPECIFICATIONS AND PERFORMANCE RECORDS

RED E. Cooper
Hale Station, TULSA, OKLAHOMA
PHONE 7131 BOX 1230
BRANCH—9619 South Main St. - - - - - - - - - Los Angeles
BRANCH—322 East Tyler St. - - - - - - - - - - Longview

Removing Air Pockets With Suction Pumps

By F. R. COZZENS
Equity Oil & Gas Company

THE oil operator who uses repressuring as a secondary recovery method is sometimes surprised to find that his wells refuse to take air. This is most likely to happen in stripper territory which has been aired previously without difficulty, and if the operator is not familiar with the field his surprise becomes a serious problem when an air pressure of 1000 pounds or more cannot be forced through a sand far enough to reach wells only a location or so away.

Solution Found

Geologists and field engineers who have studied the problem have discovered recently that a sand's sudden refusal to take air is due to the fact that when the original pressure was released, fluids, such as water, sludge, and oil, rushing in to fill the vacuum, encircled and trapped large quantities of air in various sections of the sand. This air, once surrounded by fluid cannot escape of its own accord and can seldom be forced out by pressure. The result is similar to air bubbles in a fuel line, except that air pockets in an oil sand invariably hold back reservoirs of oil which cannot be reclaimed until the pressure is released. In the Ohio and West Virginia stripper fields, where repressuring is a very important recovery measure, air pocket release is being accomplished quite effectively by means of suction pumps.

The purpose of the suction plan is to create sufficient vacuum in the bottom of a well to enable imprisoned air in the immediate vicinity to break its bonds. When a block of wells refuse to take air the operator removes pressure connections and fits the casing head of each well in the block with a small pet-cock which serves later as an intake valve. Pumping equipment (tubing and rods) is then placed in the well through which an attempt has been made to force air, and a twin action — vacuum suction pump is attached to the casing head. The pump is started and kept in continuous action, day and night. All wells in the block are watched closely, and when any back-suction is noticed, the pet-cock on that particular well is opened for an hour or so, then closed again. Back suction is detected by holding a strip of paper over the opened pet-cock, and such pressure indicates that a mass of air and fluid is being drawn towards the suction pump. The temporary opening of the pet-cock relieves the vacuum behind this mass and presently it breaks free and enters the well bearing the suction pump. Action of the pump clearly indicates when this occurs, and in some cases the amount of entombed air is sufficient to register a pressure of 100 pounds or more at the casing head. The pumping is stopped as the pocket is thus broken, and the well is opened to allow the free escape of air.

Once Is Sufficient

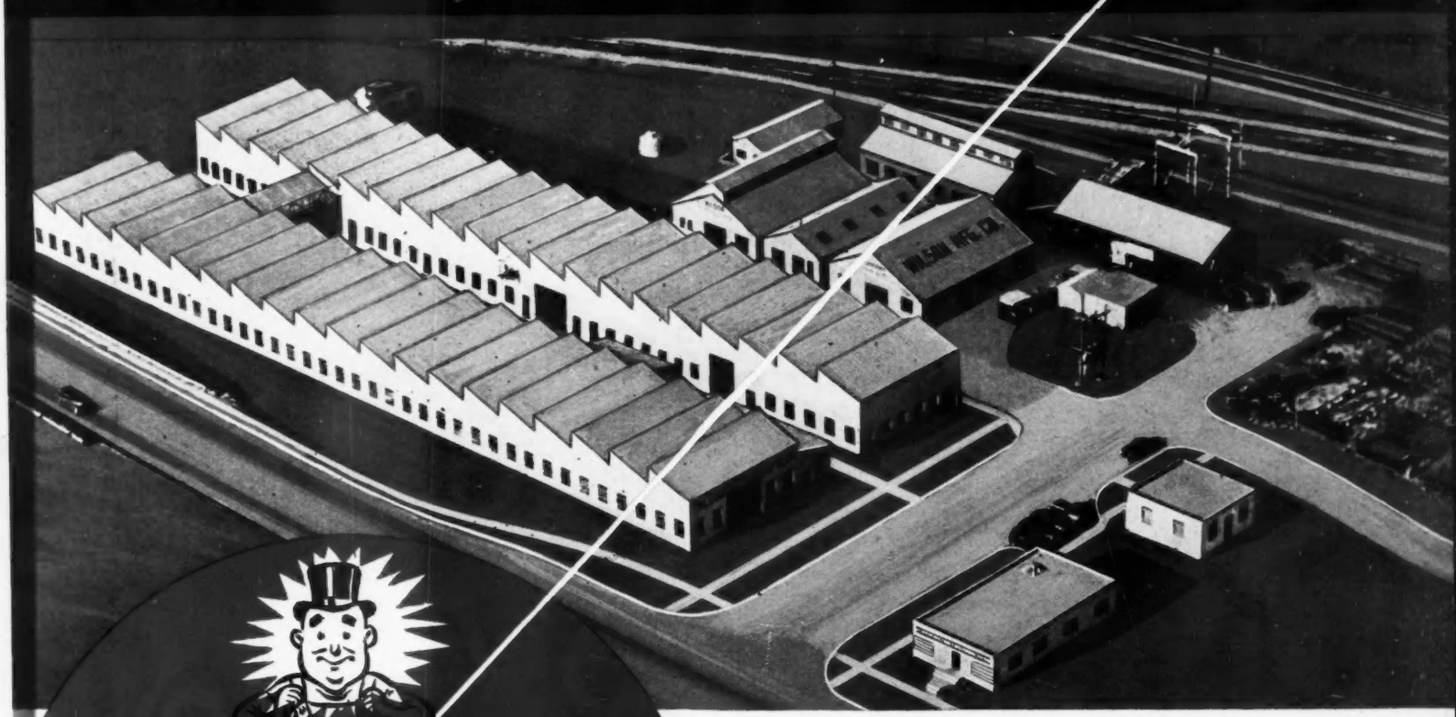
One such attempt is usually sufficient to clear a wide area of sand of air pockets, but in certain districts where sands are of a conglomerate nature, and air pockets small but numerous, it is sometimes necessary to use suction pumps on several wells (one at a time), at various locations in the block. Some operators also find it advisable to use both air pressure and suction at the same time in the release of air pockets. This is done by forcing air or natural gas into certain wells along the outskirts of the block while suction pumps are being used on wells near the center. This method is rather expensive and is seldom necessary except in localities where an operator wishes to impregnate the sand with natural gas, piped in from other sources.

The time required for breaking up air pockets by any suction method depends largely upon the texture of the sand and type of equipment used. A ten-day period of continuous suction is usually sufficient in the average field. Repressuring may be commenced immediately and many operators believe that in areas where suction pumps have been used there is less risk of air pockets forming in the future. This is due to the collapse of channels which cannot be forced by the action of air under pressure.

Low Cost

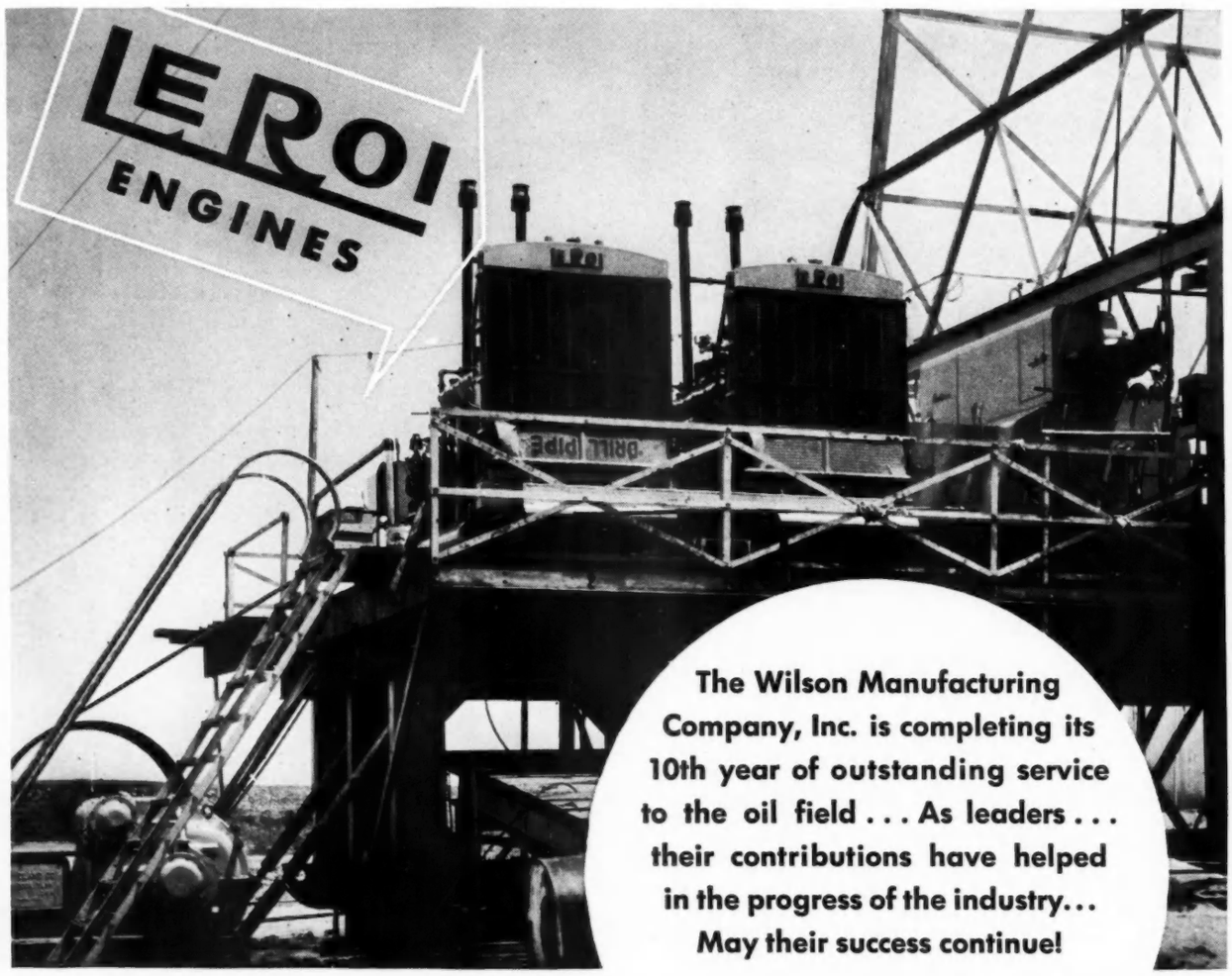
Cost of a suction operation seldom exceeds $35.00, depending in large measure upon whether the operator owns or rents his pumps. Various types of suction pumps are utilized for the purpose, and they can usually be operated from gas engine power already available on the lease. We have no record of any field where suction pumps properly used, failed to release air pockets. In practically every field, repressuring has been made more efficient by the method, and many oil operators now consider suction pumps a necessary aid in recovery equipment.

10 YEARS ...of PROGRESS



Wilson Manufacturing Co., Inc.

Ten years ago, the founders of the Wilson Manufacturing Company were "wildcatting," so to speak, in the rig building industry. With a very humble beginning, they pioneered the oil field winch and the modern type internal combustion powered rotary rig. In one decade this organization has grown to be the largest manufacturer of portable winches and power drilling rigs . . . with its products in use in practically every active oil field throughout the world!



The Wilson Manufacturing Company, Inc. is completing its 10th year of outstanding service to the oil field . . . As leaders . . . their contributions have helped in the progress of the industry... May their success continue!

...ASSURE DEPENDABLE DRILLING POWER

Available in five sizes ranging from 65 to 418 HP. Le Roi Engines are specially designed for dependable, economical oil well drilling. All sizes can be equipped to burn gasoline, natural gas or butane.

Soundly designed, ruggedly built, operating at conservative speeds, Le Roi Engines provide uninterrupted power equal to the most severe demands.

Write for bulletin on the complete Le Roi Engine line for all classes of oil field service — sizes from 2½ HP up.

LE ROI FEATURES

- ✓ Overhead Valves
- ✓ Water-Cooled Exhaust Manifold
- ✓ Dual Ignition
- ✓ Operate On Gasoline, Natural Gas or Butane

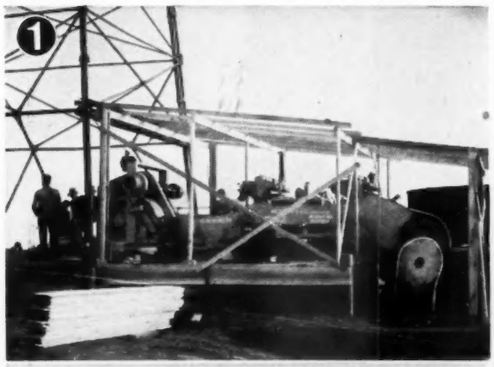
LE ROI COMPANY

MILWAUKEE, WISCONSIN TULSA, OKLAHOMA

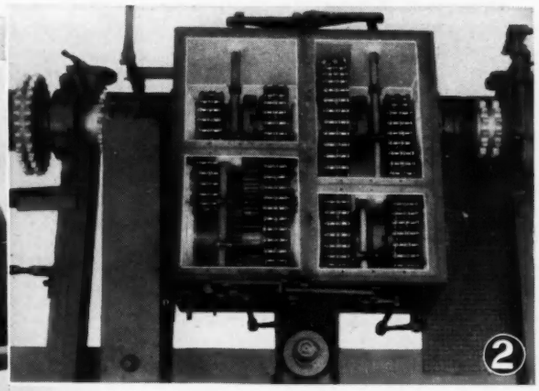
SOUTHERN ENGINE & PUMP COMPANY
Houston • Dallas • Kilgore • Brownwood
Corpus Christi, Texas

GENERAL MACHINE & SUPPLY CO.
Wichita Falls • Odessa, Texas

WESTERN MACHINERY CO.
Salem, Ill. • Evansville, Ind.



Used on the Earliest Models and on the Latest WILSON POWER RIGS



① Early Wilson Power Rig in operation in North Texas—using DIAMOND Roller Chains for the drives including the transmission.

② Transmission for Wilson Power Rig using DIAMOND Double Strand Roller Chains.

③ Late Model Heavy Duty Wilson Power Rig equipped with DIAMOND Roller Chain Drives—ready for shipment to Ecuador, S. A.

DIAMOND Roller Chain Transmissions and Drives

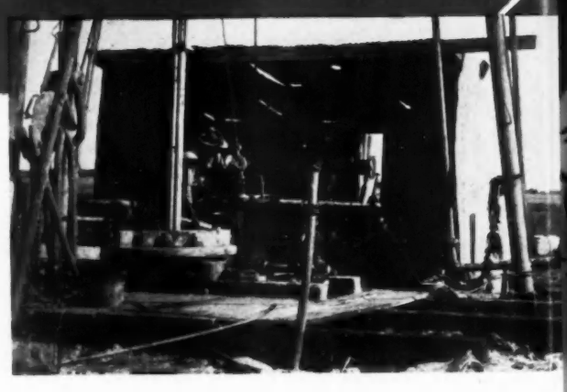
When Wilson engineers began their development work on power rigs more than ten years ago—designing for speed and portability, ruggedness and dependability,—it was natural for them to adopt roller chains among other advantages, including also transmissions equipped with DIAMOND chains in place of gears. Previous years of experience had more than proved their economy and durability on Wilson Winches.

As demands have been made for deeper holes—for still greater speeds and powers, —and as Wilson Power Rig improvements have anticipated these demands, DIAMOND roller chains have amply met all requirements.

The reputation of Wilson Power Rigs has been established by successful performance in all oil fields of the U. S. A. and other oil producing countries of the world,—Wilson's continuous standardization on DIAMOND roller chains has contributed to their records for endurance and reliability. DIAMOND CHAIN & MFG. CO., 485 Kentucky Avenue, Indianapolis, Indiana. Offices and Distributors in All Principal Cities.

Tulsa Office: 2238 Terwilleger Blvd.

10 YEARS...

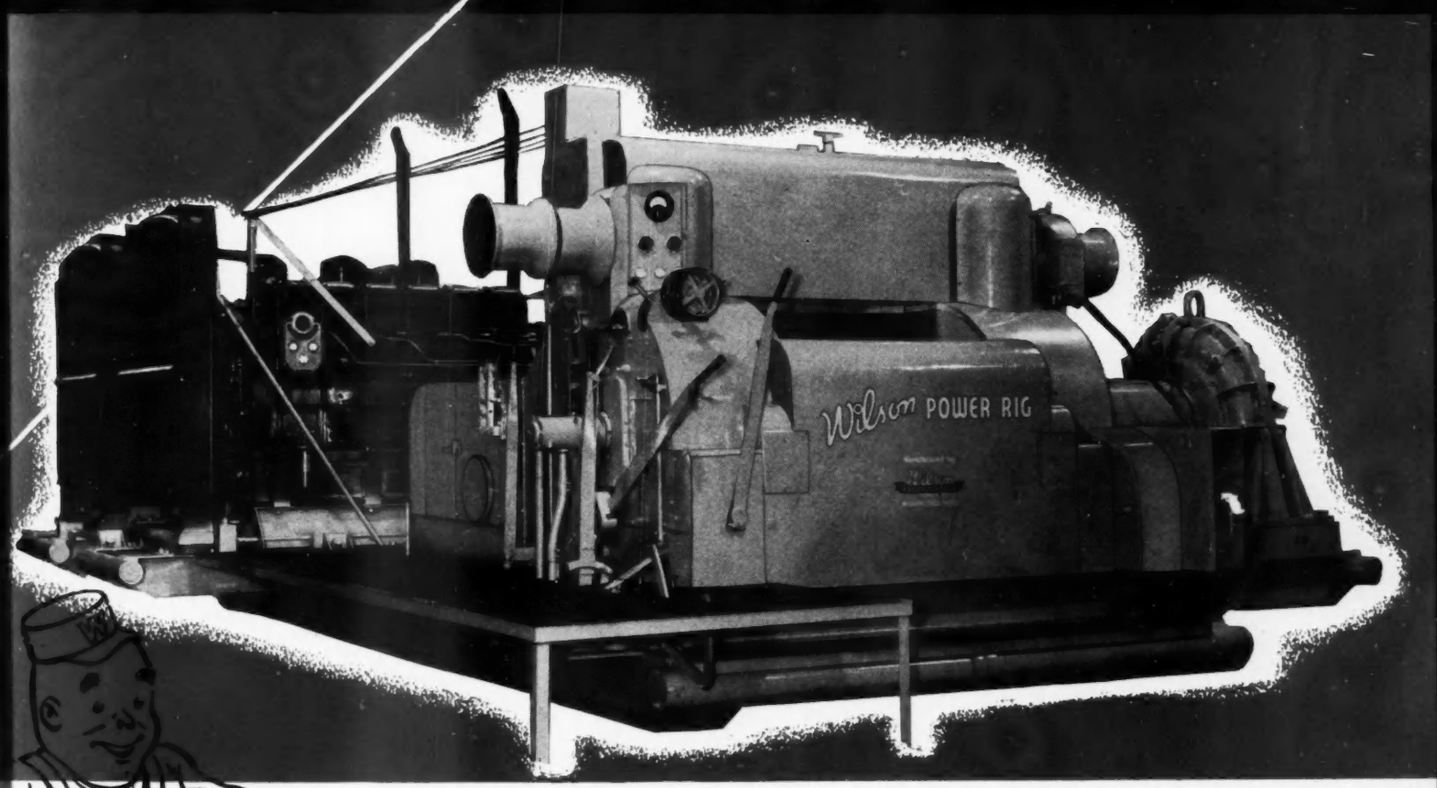


● *Wilson Rig purchased by Bobby Burns in 1933, has drilled over half-million feet of hole and is still going strong. Since this rig was purchased there has never been a time that the Wilson Manufacturing Company has not had one or more unfilled rig orders.*

● *At right, first Wilson rig purchased by Bert Shaw, October, 1930. Drilled 1,100 feet, Archer County.*

Wilson Sets the Pace!

...of PROGRESS



Today . . . as of yesterday . . . Wilson Rigs *set the pace!*

Ten years ago skeptics said that "spark plug rigs" were not practical even for thousand-foot drilling. The first Wilson Rig disproved this belief. And again the skeptics said, "But they won't drill three or four thousand feet economically." But again Wilson Rigs proved that it could be done.

And now at the close of the first decade, "Wilson" has proved that power rigs can successfully and economically drill wells of *any depth*. Deeper and deeper wells were drilled as larger models and new improvements kept pace with drilling requirements.

Costly and antiquated equipment is fast being replaced by Wilson Power Rigs. The reason is . . . they're easier to set-up, faster in operation, more economical, and thoroughly practical for any depth!

LET OUR REPRESENTATIVES GIVE YOU FACTS AND FIGURES ON ACTUAL DRILLING COSTS WITH THESE DEPENDABLE DRILLING RIGS.

Wilson **MANUFACTURING COMPANY, INC.**

WICHITA FALLS, TEXAS

EXPORT REPRESENTATIVE
Guy E. Daniels
30 Rockefeller Plaza, New York City

PACIFIC COAST DISTRIBUTOR
H. & B. Sales Co., Ltd.
Long Beach, California

● *BUILT BY THE WILSON MANUFACTURING COMPANY, INC.*

Wilson Completes

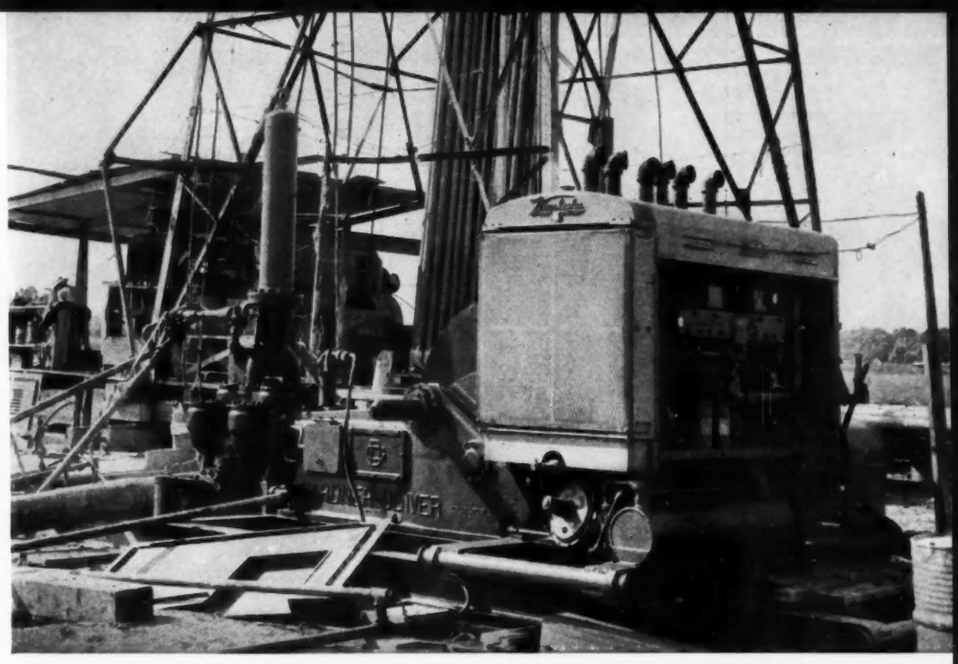
TEN YEARS OF PROGRESS!

WILSON engineers don't take time out to worry about bearing problems. For ten years they've just put them up to SKF's organization of bearing specialists—and forgotten them. Today there are "more Wilson Power Rigs in service than any other make" . . . Wilson winches tackling the tough jobs in oil fields everywhere.

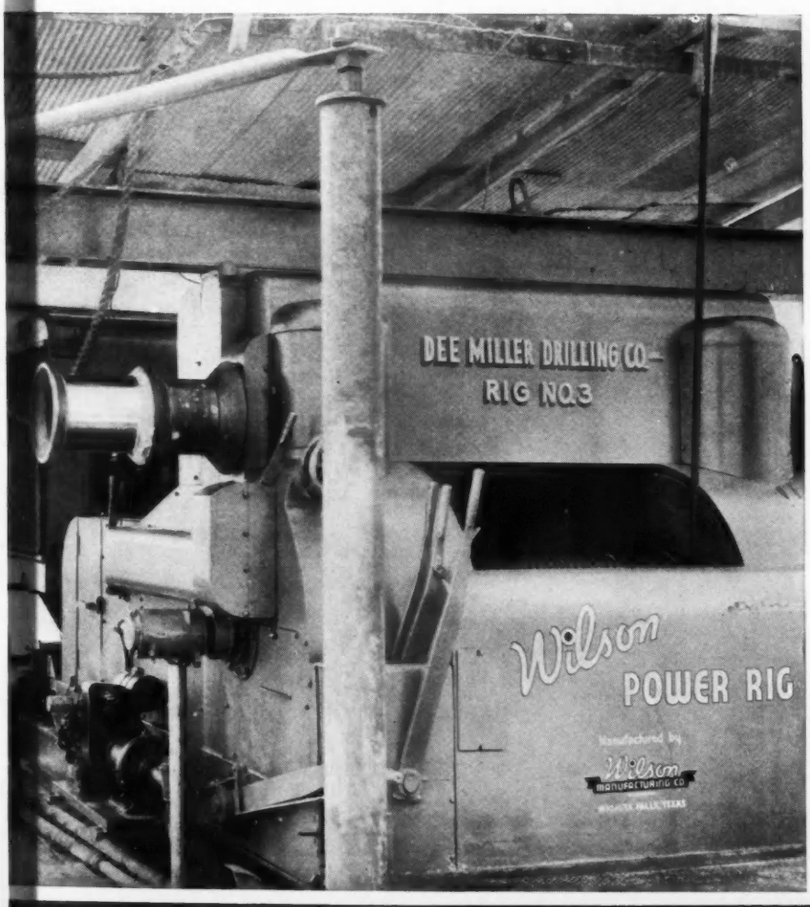
So we congratulate Wilson engineers for their foresight in selecting SKF's . . . for the new performance records established by Wilson rigs and winches of which SKF Bearings are a part. They prove again that SKF's—with their low maintenance costs, self-alignment, high capacity, ruggedness, freedom from adjustments and many other advantages—are "naturals" for machines that work hard 24 hours a day, 365 days a year. SKF Industries, Inc., Front St. & Erie Ave., Philadelphia, Penna. 4675

ROLLER SKF BEARINGS

Drilling "LARGEST WELL" with WAUKESHA ENGINES



Drilling to 2913 feet, with Wilson *draw works powered by GAK* Waukesha Engine, *and pump powered by 6-EK* Waukesha Engine, *both butane-burning engines—Dee Miller Drilling Co. brought in No. 8 Carson well with a flow of 10,800 barrels in 24 hours. Located in extreme northern part of Centralia, Ill. field, well is owned by W. C. McBride, Inc.*



A flow of 10,800 barrels in 24 hours—the largest initial production in Illinois history! The well—Carson No. 8, three miles northwest of Centralia, Illinois—is owned by W. C. McBride, Inc., and was brought in by the Dee Miller Drilling Co., Lawrenceville, Ill. Their Wilson draw works is powered by a GAK Waukesha Engine and the pump by a 6-EK Waukesha Engine. Both engines burned butane.

Production was from the Devonian lime, between 2894 and 2913 feet. Other Devonian wells have shown larger rate-per-day production, but only in 3 to 12 hour tests. None, however, have flowed so much in a period of 24 hours.

Wherever big wells are brought in . . . all through the Illinois field, *and every field* . . . you'll find Waukesha Engines supplying the power—for drilling, pumping, and every oil field use.

Waukesha Engines for oil field service range from 10 hp. to 350 hp. gasoline or gas; and 30 hp. to 325 hp. diesel fuels. *Get Bulletin 1079*—it gives you the entire Waukesha line.

WAUKESHA MOTOR COMPANY • WAUKESHA, WISCONSIN

NEW YORK • TULSA • LOS ANGELES

Foster HI-SPEED Catheads

ARE SAFEST

AND MOST ECONOMICAL

THE WILSON MANUFACTURING COMPANY is to be congratulated on becoming one of the major manufacturers of rotary draw works in the comparatively short period of ten years.

We wish to express our gratitude to the Wilson Manufacturing Company for adopting our catheads as STANDARD EQUIPMENT ON MANY OF THEIR FINE DRAW WORKS.

The following are some of the special features of the Foster *Hi-Speed* Cathead:

Surfaces that are subjected to hard wear are made of hardened steel.

All wearing parts easily replaced without removing the cathead from the line-shaft.

Complete clutch engagement regardless of line-shaft speed.

Roller Bearings and Oil Bath Lubrication.

Foster *Hi-Speed* Cathead is STANDARD EQUIPMENT on Brewster, Emsco, National and Wilson Draw Works.

Other Foster Cathead Equipment:

CATLINE HOIST

Replaces the dangerous and expensive Manila catline with a wire line on a friction driven drum.

MAKE AND BREAK CATHEAD

Combines Foster *Hi-Speed* cathead with friction driven drum for spinning and tonging drill pipe and casing.

IF YOU WANT THE BEST IN AUTOMATIC CATHEADS BUY FOSTER *HI-SPEED*

For further information

CONSULT YOUR SUPPLY STORE OR WRITE

FOSTER CATHEAD COMPANY

BOX 1675 · WICHITA FALLS, TEXAS

DRILLING CONTRACTORS' NOTEBOOK

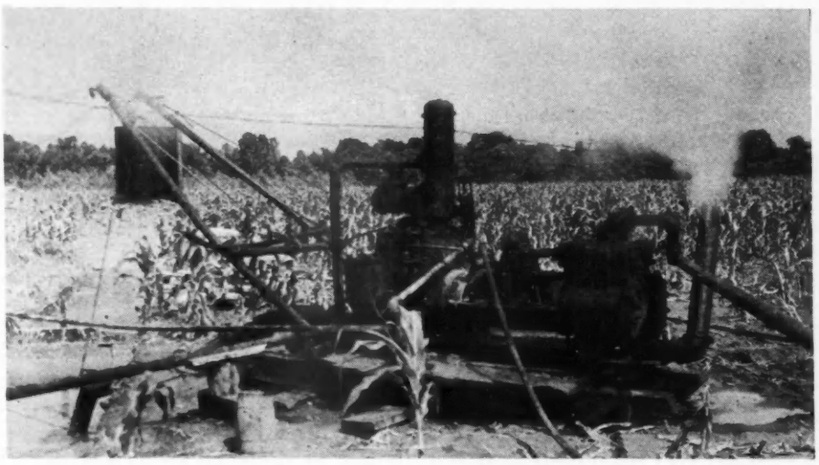
Helpful Suggestions For Those Interested In Drilling Methods

Operating Ideas Maintenance Hints New Rig Hook-ups

Published as a regular feature of THE OIL WEEKLY

1. MUD HANDLING

Pump Suction Foot Valve Raised and Lowered by Means of Boom



This boom of 2-inch pipe facilitates raising and lowering pump suction foot valve.

A BOOM may be used to raise and lower the pump suction foot valve, instead of an A-frame across the mud pit. Made a part of the unit and attached permanently in position for instant use, the boom is made of 2-inch pipe having a cross member at the lower end that sets jam up against the frame of the pump at the fluid end. Supporting cables attached to the extreme end of the boom are also fastened to the pump near the top, or to the compression chamber. A small sheave attached to the extreme end of the boom carries a wire line, operated with a cross shaft having a ratchet and operating handle.

A kitchen vegetable strainer may be used to catch rotary drill cuttings.

2. MUD HANDLING

Cuttings Collected by Kitchen Strainer

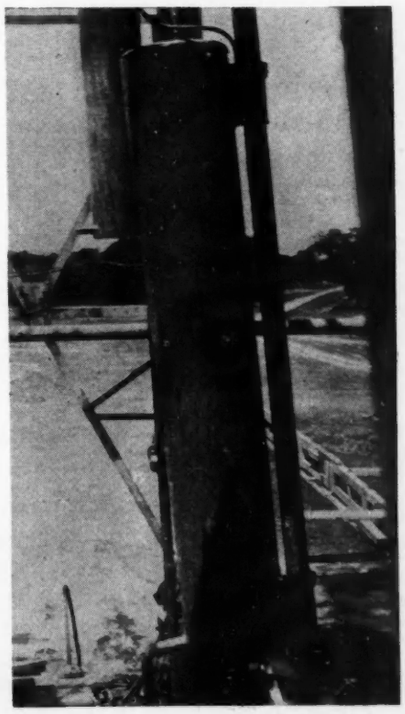
WHEN obtaining samples of formation penetrated by the drill, an improvised tool in common use in kitchens may be used. A large fruit strainer, set across the sample box, permits the fluid to escape, but retains particles of rock and shales brought up from bottom by the circulating mud.

3. SAFETY

Tong Counterweights Held Securely

A MAJOR company operating on the Texas Gulf Coast eliminates the danger of loosely swinging tong counterweights by U-bolting two sections of 2-inch pipe between first and third girts on the derrick front as guides or slides to which the counterweights are held by short collars of 2½-inch pipe.

Counterweights are free to travel along the guides but cannot fall near the center of the derrick floor



This counterweight of 10-inch pipe is prevented from swinging loosely.

This rack with skid-type base provides tilting retainers for four lubricant drums.

in the event of a broken cable. Collars on the 2-inch pipe serving as a guide may be spaced to arrest the 2½-inch collars at the desired limits of travel.

Counterweights are not a solid section, but consist of 4½-foot sections of 10-inch pipe blinded at both ends and equipped with drain pipe and fill vent through which water may be run to make the weight required for the particular tongs in use. As the counterweights may be completely drained when dismantling the rig, loading and unloading is simplified.

4. LUBRICATION

Rack Accommodates Four Oil Drums

DRUMS containing oil to lubricate mechanical drilling rigs may be mounted on tilting retainers by making a foundation of 3-inch pipe, skid type construction, having A-frame risers at each end and at required intervals between. The top of each frame is equipped with two trunnions, made of 2-inch nipples of ¾-inch pipe, one welded above the other and both welded to the apex of the frame. Saddles, or drum retainers are made with flat bar bottoms having 1-inch rods as side pieces. Each rod is threaded at the top for a nut. The rod passes through holes in a strap laid on top of the drum and pulled tight. Thole pins slightly above the gravity center of the side bars pass through the trunnions so the drums may be tilted to any position from horizontal to vertical.

5. TRANSPORTATION

Convenient Rack for Pipe Trucking

SCRAP pipe and connection materials may be efficiently trucked to location by means of a welded pipe skid rack, 20 feet long and 6 feet wide. A winch line is looped through the triangular front end support of the rack to bring it onto the truck. The weight is so distributed that although more than one-half of the rack protudes beyond the end of the truck, it is in no danger of rearing up.

The rack is constructed of 3½- and 6½-inch pipe. An added safety feature is a chain tie-down across the rack at approximately the rear of the truck. The unit is moving materials for Summit Drilling Company's rotary rig in the Kendrick pool, Lincoln County, Oklahoma.

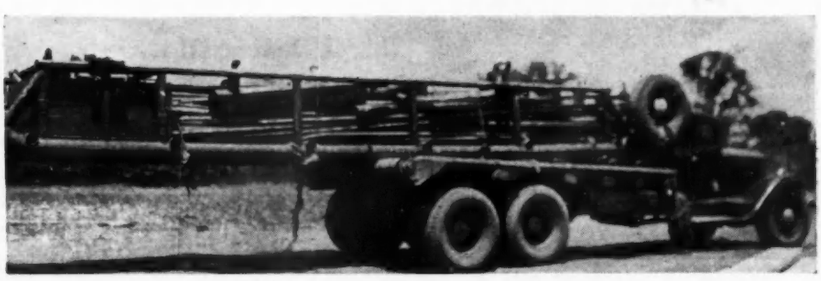
6. FUEL SUPPLY

Hose Protected by Pipe on Ground

OLSON Drilling Company protects the butane fuel line from possible injury from field trucks and personnel by running it through a section of 2½-inch tubing.

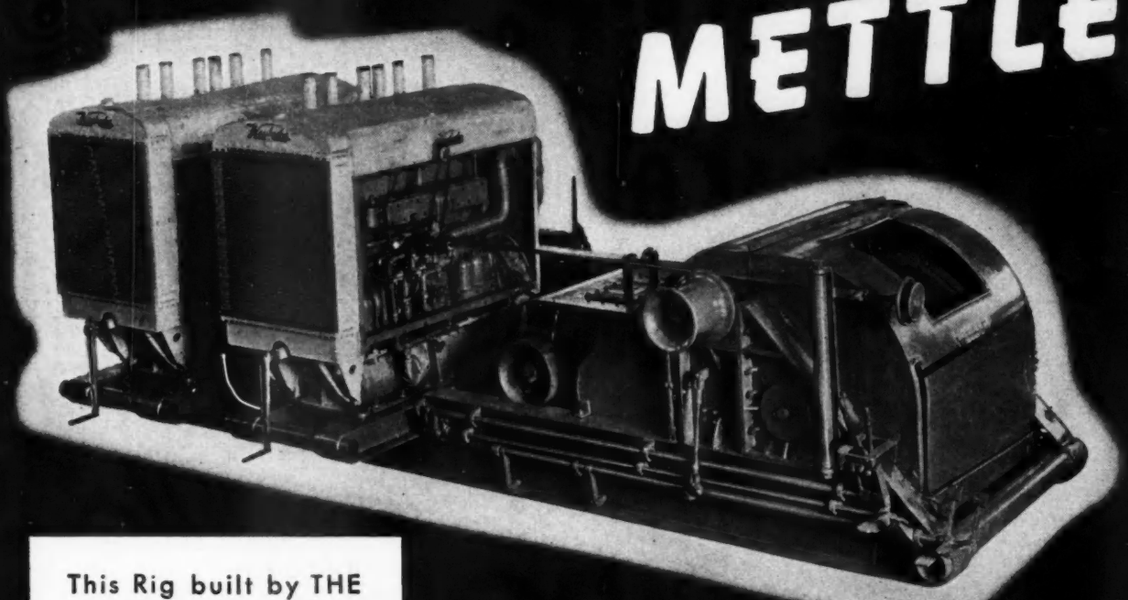
The section of pipe is placed mid-way between the fuel container and the drilling engines. It rests securely on the ground, placing no tension on line. The rig is operating in the East Cromwell pool of Okfuskee County.

Protection for the butane fuel line is provided by this piece of tubing.

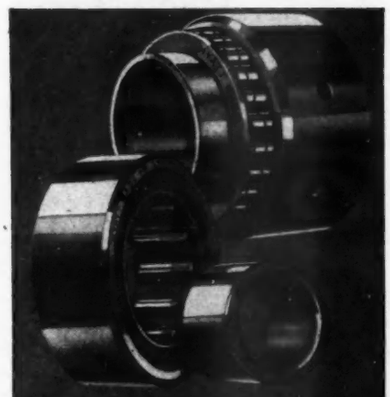


Scrap pipe, connection materials and tools are conveniently trucked with this rack.

PROVING THEIR METTLE



This Rig built by THE BREWSTER CO., INC., of Shreveport, La., has a full quota of Hyatt Roller Bearings to keep it always on the go.



HYATT
ROLLER
BEARINGS

UNDER HEAVY LOADS day in and day out . . . Hyatts run smoothly and enduringly! No matter what the application—Hyatts keep equipment working . . . survive where others fail! Everywhere Hyatt Roller Bearings are proving their mettle and are assuring dependable operation and longer equipment life! Look for these better bearings in the machines you buy! Hyatt Bearings Division, General Motors Sales Corporation, Harrison, N. J., Detroit, Chicago, Pittsburgh and San Francisco.

"SAFETY FIRST"

CALLS FOR THE NEW

REED SPEED SAFETY ECONOMY ENDURANCE ROCK BIT

REED ROLLER BIT COMPANY

HIGHLIGHTS IN THE WEEK'S NEWS

Federal Anti-Trust Suit

Government's Action Drops Plea for Disintegration

The Department of Justice this week launched its long-expected suit against the oil industry, but devoid of the demand for disintegration which last month aroused the vigorous opposition of the National Defense Advisory Commission.

The department, on September 30, filed its complaint in the Federal Court for the District of Columbia, attacking the buying and marketing practices of 22 major oil companies and their subsidiaries and affiliates and naming the American Petroleum Institute as a party to the proceedings.

At the same time, Attorney General Robert H. Jackson announced that suits would be filed against three pipe line companies under the Elkins Act and, in a letter to Senator Guy M. Gillette of Iowa, urged that Congress enact such divorce or other legislation as may be necessary to protect the Nation's oil reserves.

While the disintegration issue is not now to be pressed, the department emphasized that it had not been abandoned, but may be revived at a more opportune time or even in the trial of the suit just filed if it appears "that the abuses in the oil industry can be corrected in no other way."

The 22 companies named in the suit are The Atlantic Refining Company, Barnsdall Oil Company, Cities Service Company, Consolidated Oil Corporation, Continental Oil Company, Gulf Oil Corporation, Mid-Continent Petroleum Corporation, The Ohio Oil Company, Phillips Petroleum Company, The Pure Oil Company, Shell Union Oil Company, Skelly Oil Company, Socony-Vacuum Oil Company, Standard Oil Company of California, Standard Oil Company (Indiana), Standard Oil Company of Kentucky, Standard Oil Company of New Jersey, Standard Oil Company of Ohio, Sun Oil Company, The Texas Corporation, Tide Water Associated Oil Company, Union Oil Company, and approximately 330 subsidiaries.

Against Producers

For the first time in its current trust-busting campaign, the government went into the production phases of the industry, charging, among other things, that the defendants:

Have conspired to fix and maintain, uniform, noncompetitive prices to be paid by them for crude purchased from independent producers and to be charged by them for crude sold to independent refiners;

Have conspired to restrict the production of crude oil and the manufacture of petroleum products;

Defendants who control gathering systems have conspired to compel independent producers who have no other practical means of transporation to competitive markets, to sell crude to the defendants at the well rather than permitting the independents to use such pipe lines on a common-carrier basis;

Have agreed to adopt and file with the Interstate Commerce Commission rules and regulations covering interstate transportation which require the tender of unreasonably large quantities; to maintain uniform noncompetitive, onerous and oppressive rates, and to fail to provide shippers with the ordinary common-carrier terminal facilities;

Have conspired to charge excessive rates for the use of crude-oil and gasoline pipe lines and to receive back as refunds and rebates on the rates charged to themselves a substantial part of the revenue from pipe line operations;

Have conspired to cause railroads to establish and maintain rates favorable to themselves and unfavorable to independent refiners;

Have acquired a dominant control over tankers, barges, tank cars and other transportation facilities, and have conspired to maintain excessive rates for their use;

Have conspired to distribute their products only through facilities operated by persons or companies whose buying, selling and operating policies can be controlled, thus obtaining control over practically all bulk plants through which petroleum products pass from refineries to service stations.

[*Continued on page 64*]

News Index

General:
- Washington 63
- Allowables 68
- Associations 69
- Pipe Lines 72

World Wide Developments.. 69
Markets-Statistics 70
Crude Oil Prices.....72 and 74
Men in News..... 97
U. S. Field Operations:
- Arkansas 88
- California 90
- Completions 91
- East Texas 85
- Forest City Basin..... 80
- Illinois 77
- Indiana 77
- Kansas 78
- Kentucky 78
- Louisiana Coast 87
- Michigan 90
- Mississippi 89
- New Mexico 78
- North Louisiana 88
- North Texas 83
- Oklahoma 78
- Southeastern States 89
- Southwest Texas 86
- Texas Gulf Coast..... 87
- West Texas 82
- Wildcat Development 95

Solons Call for Investigation Of Defense Recommendation

Charging that nine of the 11 men who participated in formulating the National Defense Commission's report opposing inclusion of a disintegration demand in the oil suit filed by the Department of Justice last week in the District of Columbia Federal Court had a personal interest in the matter, members of both houses of Congress on October 4 joined in a demand for a thorough investigation of the handling of the case.

In the upper house, Senator Guy M. Gillette served notice that he would reintroduce his bills for divorcement of pipe lines and marketing from other branches of the industry and press for action on the legislation next session, and in the House of Representatives, Congressman John M. Coffee urged adoption of his resolution for investigation of the enforcement of the anti-trust laws.

Reviewing the history of the suit filed September 30, Gillette expressed gratification over the action and told the Senate that "for a long time, there were many of us who felt that the large, integrated oil companies were taking advantage of a situation which ought to be corrected."

The senator put into the record letters which indicated that on August 14 he wrote Assistant Attorney General Thurman Arnold that unless good reasons could be given for the delay in bringing suit he would reopen hearings on his bills, which had been suspended at the department's suggestion, and was informed by Arnold that the matter had been referred to the National Defense Commission.

A month later, he wrote to the attorney general and after 10 days received a reply that the commission had made a report and the case was about to be filed.

"Standard and Shell"

"Without making any insidious or unfair attack," he said, "I should like to refer to the fact that of the eleven members of the advisory commission to the Council of National Defense who had this matter under consideration, nine were connected with the Standard Oil Company or with the Shell Oil Company and had a personal interest in the subject matter.

"I do not mean to suggest that it is improper to have on the Council of National Defense men conversant with the oil industry. It was highly proper. It was very essential to have on the commission men with some knowledge of the industry; but I want the fact to appear that of the eleven men who were considering the effect of these suits, nine were actual potential defendants if the suits were filed."

Because of these delays, Gillette pointed out, it will be impossible to get

action on his bills this session, "but it is my intention in January, when the next Congress assembles, to reintroduce these measures substantially as they are at this time.

"I wish to give notice that as soon as they are introduced I shall have them referred, if possible, to the same subcommittee to resume the hearings where they were left off," he said.

Won't Tolerate Supervisory Board

At the same time, the senator struck out against proposals for setting up a supervisory body over the industry as suggested in reports of conferences between Secretary of the Interior Harold L. Ickes and industry representatives.

"I do not know whether or not that report is true," he declared. "The only authority I have for it is a number of excerpts and clippings which were sent to me reciting that such is the plan. But I wish to give notice now that no supervisory body composed of the secretary of the interior, or any other official, and Mr. Teagle or anyone else representing the oil companies, shall supersede the legislative rights of the American Congress to go into this whole field. When this proposed legislation is reintroduced, if such a body is contemplated or appointed, it will not deter or delay, so far as I am able to secure action, proper action, by the Senate of the United States."

Reciting the names and connections of oil men connected with the defense commission, Coffee told the House that, "until otherwise shown, every one of these gentlemen is under a cloud of having had something to do with the proparation or contents of the report of the Council of National Defense on the oil anti-trust suit.

"These men are practically all connected with companies which would be affected by the proposed anti-trust suit to bring about pipe-line divorcement and marketing divorcement in the oil industry," he said. "They are real parties at interest; and if they had any part in the decision of the Council of National Defense, their activity may be only the prelude to the defeat of our democratic form of government. It is not a democratic process to permit the employes of the accused to serve on a jury, nor should they be permitted to pass judgment on a case before it is submitted to the courts for vindication."

Coffee said then he had been "reliably informed" that serving on the commission are Dr. Robert E. Wilson, principal oil adviser, president of Pan American Petroleum & Transport Company; C. C. Monrad, technical assistant, formerly employed by Standard Oil Company of Indiana; Fayette B. Dow, pipe-line transportation adviser, Washington attorney for the American Petroleum Institute and Washington counsel for many pipe line companies; S. D. Heron, aviation gasoline expert, connected with Ethyl Gasoline Corporation; T. A. Boyd, oil adviser, General Motors Corporation; Walter G. Whitman, chairman of aviation fuels committee, former research expert for Standard Oil Company of Indiana; Dr. D. P. Barnard, oil adviser, associate director of research for Standard Oil Company of Indiana; Gerald H. B. Davis, oil adviser, director of research laboratories of Standard Oil Development Company; Major James H. Doolittle, oil adviser, head of the aviation department of Shell Oil Company; J. Bennett Hill, oil adviser, manager of the development division of Sun Oil Company, and C. R. Dooley, adviser to the labor division, industrial relations manager of Socony-Vacuum Oil Company.

In addition, Coffee referred to the special committee of oil company engineers appointed by Dr. Wilson to advise the Army and Navy on storage systems.

Indiana Standard Target in First Elkins Act Prosecution

First of three test cases which Attorney General Robert P. Jackson said would be filed against pipe-line companies was brought against Standard Oil Company of Indiana in the Federal District Court in Hammond, Indiana, October 2, charging violation of the Elkins Act.

The act prohibits return of part of a purchase price to the original seller by the buyer, and has been on the statute books since 1903. Known as the anti-rebate act, it has seldom been enforced.

Attempted applicaation of the Elkins law to pipe-line companies is the first effort which has been made to deal with the situation in this manner, although it has long been contended by independent oil interests and agreed by the Department of Justice that the law is sufficiently broad to cover the rebates which the owning oil companies are alleged to have received from their pipe lines.

Representatives of the company explained that Stanolind Pipe Line Company, a wholly owned subsidiary, constitutes merely a plant facility for transporting crude oil from the producing fields to refineries. As such, it was maintained, it has accumulated no profits in the usual meaning of the word, although Standard has paid transportation charges at rates approved by the Interstate Commerce Commission.

The surplus cash accumulated by the pipe line company has from time to time been returned to the parent company in dividends, and both the pipe line charges and the dividends are subject to taxes.

"If the pipe line company were organized as a department of the Standard of Indiana there would be no question of rebate because there would be no dividends," it was contended by Buell Jones, counsel for the company. "If dividends paid under the circumstances herein mentioned are found to be a rebate it will be in a very new and revolutionary construction of the Elkins Act.

"The question has never been raised before, but if such payments as are involved in this case should be held to be rebates under the Elkins Act, then many other parent companies are in for prosecution as the result of accepting dividends from companies which they own in whole or in part."

Recent studies by the Interstate Commerce Commission showed that in 1938 there were 58 interstate oil pipe line carriers which paid a total of $79,388,389 in dividends, of which $36,307,568 was paid from accumulated surplus. All but a few of these companies operated as subsidiaries of oil companies.

Government Action

[*Continued from page 63*]

In addition, the complaint charged that the companies have conspired to control retail marketing by controlling filling stations, granting differentials to exclusive dealers, forcing full-line selling, fixing prices and marketing and price policies and enforcing exorbitant price differentials between various grades of gasoline.

Dissolve Institute

With respect to the American Petroleum Institute, the government charges the defendants unlawfully combined to create and utilize the association and its various committees as an instrumentality for promoting, supervising and enforcing the various illegal policies and practices set forth in the complaint.

The petition seeks an injunction against the continuance of these and other practices and dissolution of the Institute.

The decision of the department to confine the suit to these issues, rather than to force the disintegration demand at this time, was disclosed in a letter from the Attorney General to Senator Gillette, who had led a Congressional group in a demand that the government proceed immediately with the case.

Because of the problem of national defense, Jackson wrote, the department had adopted the recommendations of the National Defense Advisory Commission.

"The Defense Commission advised me that it would wholeheartedly approve 'any appropriate legal action brought to eliminate such restraints on competition where they are proven to exist'," he said. "In accordance therewith I have authorized the Anti-trust Division to commence the proposed civil action so far as it seeks to prevent existing abuses in the oil industry, including price-fixing, discriminations, and all practices which tend to restrain or prejudice the independents in the industry or to jeopardize the interests of consumers.

"The Defense Commission indicated that a court decree of divestiture at this time would create a number of serious problems for the national defense. Accordingly, this action does not seek at this time to compel the oil companies to get rid of their pipe lines, barges, or other facilities for the transportation and distribution of petroleum. I believe there might be serious consequences from a disruption of these facilities at a time when we have no capital presently willing, so far as I am able to ascertain, to acquire and operate these facilities by themselves.

"The National Defense Commission, however, referring to the divestiture phase of the case, says 'the commission does not suggest that the proposed suit should be abandoned.' It is not being abandoned, and no action is being taken inconsistent with divestiture proceedings, either in a later action or by amendment of proceedings in the existing suit if, at the time of trial it shall appear that the abuses in the oil industry can be corrected in no other way."

At the same time, he told the Senator, there is "no reason why the pendency of this action in any form should

HOW TO DRIVE IT...

TO GET LOWER COST PER FOOT OF HOLE!

Want lower cost per foot of hole? Rechain your drilling rigs, cleanout rigs, jackshafts or slush pump drives with Rex! Rex Standard, Deepwell, Champion, Universal and Roller chains form a cost-cutting quintet—each with the *good* features of other *good* chains, *plus* distinctive qualities for resisting wear and lengthening working life.

For instance, in Rex drilling chains (which are pre-lubricated at the plant to protect them during the "breaking-in" period) positive pin locks defeat destruction at the joints. These are only a couple of the many features that make them a sound choice for drives on your rigs. They are available in either the riveted or cottered type.

Rex Roller Chains, in single or multiple widths, are built with watchlike precision, durable in service, smooth in operation, quiet at high speeds. These Rex chains are used in oil fields the world over for heavy-duty, high-speed service.

Your oil field rechaining problems will be made a lot easier if you have a copy of the Rex Oil Well Chain Data Book to use as a reference. This handy book is yours for the asking, too—just address the Chain Belt Company, 1639 West Bruce Street, Milwaukee, Wisconsin, and ask for your copy.

SOLD FROM STOCK
IN ALL MAJOR OIL FIELDS

REX CHAIN

CHAIN BELT COMPANY OF MILWAUKEE

interfere with or delay legislative consideration of the problems of the oil industry," pointing out that many years may elapse before a final decision is reached and that court decrees are in the main "negative affairs forbidding certain acts, combinations and contracts" but not necessarily leading to constructive steps in industry.

"The statement most significant to me in the report of the Defense Commission has been almost wholly overlooked in the discussion of these cases," he continued. "It states 'though by simple arithmetic it would appear that the country's reserves are good for more than ten years under emergency conditions, declining production and higher prices for petroleum will arrive long before exhaustion of reserves unless the discovery rate is maintained and production is effected with a minimum of waste.' The very fact that in considering national defense we begin to calcu'ate the life of our oil reserves in such small figures is an ominous sign for national defense and for our economic life.

"In advocating revision of the anti-trust laws over three years ago to make them effective and clear, I repeatedly said that in my opinion the doctrine of compulsory competition embodied in the anti-trust laws is unwisely applied to oil production where the principle of conservation of an exhaustible and irreplaceable national resource should replace the principle of competitive exploitation. The companies seem to recognize this for they have tried to limit depletion by devices of their own, but without representation of the public interest or the consumer welfare, or that of smaller producers. Private conservation plans which restrain or discriminate against independents and disregard consumer interests violate the anti-trust laws, but they should not be replaced by a headlong race to exhaust petroleum supplies, but rather by a conservation plan which will be in the public interest.

"Only Congress can protect the future economic life of this country by protecting oil reserves in the ground. It has made several efforts to do so, some of which have failed. I believe more comprehensive plans could be devised now which would be successful. Litigation by itself will never completely accomplish the wise utilization of this great asset by this generation or its conservation for the future."

Three Pipe-Line Suits

The three pipe-line suits which are to be brought will be filed in the Delaware District Court against Phillips Petroleum Company and Phillips Pipe Line Company, in the same court against Great Lakes Pipe Line Company, and in the Northern District of Indiana Court against the Standard Oil Company (Indiana).

"These three suits," the department explained, "were selected as representative proceedings to clarify the law with respect to all cases where pipe lines are owned by the major oil companies. They charge the major oil companies involved with taking rebates from common-carrier pipe lines on the oil which the majors ship. The method by which these rebates are alleged to be taken is as follows: The major oil companies own the capital stock of the pipe line companies, pay the published tariff rates and receive refunds from such rates under the guise of dividends on the stock. During the year, 1939, the net earnings of Phillips Pipe Line Company amounted to 49 percent of transportation revenues; the Great Lakes Pipe Line Company 49.5 percent; and Stanolind Pipe Line Company 36 percent. These earnings were paid back in the form of dividends to the major oil companies which ship the oil, thus giving the major oil company shippers a tremendous advantage over their independent competitors.

"This the Department of Justice contends is an illegal rebate under the Elkins Act."

Price Fixing

In a lengthy analytical statement of the allegations in the complaint filed in the District of Columbia Court, the department explained that the conspiracy alleged in the fixing of crude prices is carried out by the posting of prices by one of the defendants, which are followed by the others.

"In fields where independent refiners compete with the defendants in the purchase of crude oil, higher prices are fixed, thus putting the independent refiners at a competitive disadvantage and driving them from the market." it was charged. "Through their activities, defendants control practically all of the supply of crude oil available for refining; hence, independent refiners, most of whom do not have independent sources of crude oil, are compelled to purchase all or a large part of their requirements from the defendants at prices fixed by agreement, thereby placing independent refiners at a substantial price disadvantage."

The restrictions on crude production and the manufacture of oil products, it was explained, are alleged to have been "accomplished in part through a system of reports made to the American Petroleum Institute covering the amounts of locations of all stocks of petroleum products owned or held by each of the defendants. From these reports the Institute is able to make suggestions as to the amounts of petroleum products which should be manufactured and maintained in storage. These amounts are less than the amounts which would normally be produced and manufactured. It is alleged that the Institute's suggestions are adopted by the defendants, thereby accomplishing the restrictions. It is charged that the defendants have agreed to receive in their crude-oil-gathering lines from independent producers who are dependent upon such lines for transportation, less crude oil than the amounts which such independents would normally produce, thereby reducing the amount of crude oil produced by the independent producers."

Group's Ownership

The defendant companies were said by the department to own or control at the present time 60 percent of the investment in the industry, 68 percent of the crude-oil reserves, 50 percent of the production of crude oil, 92 percent of the stocks of crude oil, 79 percent of the crude-oil storage capacity, 90 percent of the imports of crude oil, 85 percent of crude-oil trunk pipe-line mileage, 96 percent of the crude transported in trunk pipe lines, 76 percent of the crude-oil refining capacity, 87 percent of the cracking capacity, 85 percent of gasoline production, 95 percent of gasoline exports, 96 percent of gasoline pipe line mileage, 87 percent of the dead weight tonnage of oil tankers, 88 to 93 percent of the stocks of the principal petroleum products and 75 percent of all the bulk plants and service stations.

"This proceeding is being instituted under the department's policy of taking up in a single investigation or proceeding all of the restraints which affect the distribution of a product from the raw material to the consumer," it was explained. "Only in this way can economic results be achieved. Piecemeal prosecutions against segments of an industry are both costly and inconclusive. They do not raise the fundamental issues which the court should decide, and therefore do not clarify the law. They allow restraints of trade to flourish, in one segment of the industry while they are being prosecuted in another.

"In the past 10 years, the department has been flooded with complaints from independents and consumers against various practices in the oil industry. These complaints have resulted in a series of piecemeal prosecutions in all of which the government has been successful. Yet in spite of the success of these prosecutions, the complaints continue, prices are still inflexible, independent enterprise is still under a handicap, because the cases applied only to segments rather than to the entire structure of the industry.

"For this reason the present action is brought. It will eventually present to the Supreme Court of the United States for final decision all of the issues with respect to the reasonableness of the present vast combinations in the production, transportation, refining and distribution of petroleum products."

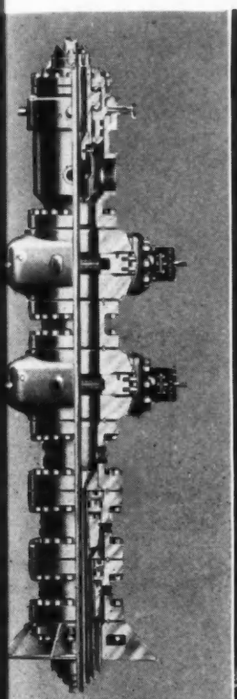
The "emphasis" of this action, it was asserted, is not only "on the interests of independents but on the interests of consumers who have not as yet benefited from the recent successful prosecutions in the Ethyl Gasoline case and the Madison oil case."

"Unreasonable" Power

"It is believed that the great advances and technological improvements in the oil industry are not being passed on to consumers because of a wasteful, inefficient distribution system which leads to excessive prices," the department said. "Through their domination of all phases of the industry the major companies have created a system which has led to identical policies with respect to price and the suppression of free and independent enterprise. That system has given the consumer a wasteful and uneconomic distribution of gasoline, fuel oils, lubricants and kerosene. It has eliminated competing enterprise. It has destroyed the opportunity for new enterprise and capital to enter the field. It has established a small group of individuals in control of a $15,000,000,000 industry under a system where there is no incentive to compete among themselves and every incentive to prevent the entry into the market of those who would otherwise sell to consumers at lower prices. This system has closed the door to any new initiative in the oil industry which might disturb the settled policies with respect to production, transportation, refining and marketing.

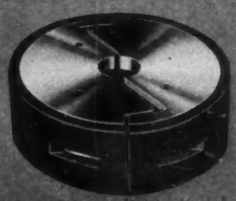
"The unreasonable power possessed and exercised by the integrated companies has deprived the consumer of natural advantages due to location. It has taken from the consumer the

Bring on your PRESSURE!

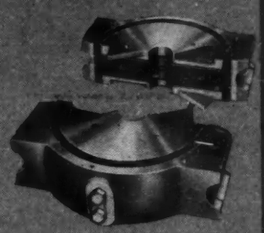


Shaffer cellar control
. Upper one to close
d drill pipe. Lower one
master gate for com-
shut-off when pipe is
of the hole; (bottom)
l type landing heads
base plate.

Neoprene ram packing element.



Neoprene ram packing element on rams.



Rams complete (in open position) including ram carriers, rams and neoprene packing elements.

Story and pictures courtesy Shaffer Tool Works, Brea, California

Thanks to neoprene, this drilling control hook-up licks high-pressure jobs!

PACKING OFF against trouble is routine stuff for Shaffer's drilling control hook-up. That's why they put it on this job to lick the pressure hazards of gas-charged upper sands caused by early-day blowouts and craters. Naturally, Shaffer takes no chances on packing material. Neoprene is used at all vital points in this safety hook-up where natural rubber can't stand the gaff.

Here's the set-up: The upper ram-type cellar control gate packs securely around drill pipe in event of emergency. The cellar control gate, with complete shut-off rams, is ready for instant action when drill pipe is out of the hole. The full opening spool-type landing head permits safe running and landing of casing. The combination rotating blowout preventer and stripper is installed above the upper ram-type gate, ready to take on the load should the job require drilling under pressure.

And here's where neoprene comes in: The neoprene parts which help this equipment to do its job efficiently are shown in the drawing at the left—they include a neoprene stripper and two packing rings in the rotating blowout preventer at the top . . . neoprene ram packing in the ram-type preventer and master gate valve, center . . . neoprene packing rings in the landing head assembly, bottom. The neoprene ram packing is illustrated in close-up views at the right.

Shaffer uses neoprene in West Texas when drilling in with oil or running tubing in oil . . . in Bahrein where climatic conditions play havoc with natural rubber . . . in California when stripping tubing in and out of wells . . . in innumerable places where oils, gases, acids and the like present problems too difficult for natural rubber to solve.

Neoprene is the remarkable chemical rubber made by Du Pont. It resembles natural rubber in strength, elasticity and toughness . . . but it's also resistant to oils, gasoline, heat, sunlight, aging, even corrosive acids and gases. Like most manufacturers of oil country equipment, Shaffer turns to neoprene for the jobs natural rubber can't handle. Where the going is tough, it pays to specify neoprene!

▶ Be sure to see our exhibit at the National Metal Exposition in Cleveland, October 21—25

DU PONT
NEOPRENE
the chemical rubber

opportunity to purchase a variety of products. It has withheld from the consumer the benefits of technological improvements which should be reflected in lower costs. It has fostered and preserved an uneconomic, duplicative, and wasteful marketing system. And finally, the power of the integrated companies has determined the production of oil, necessary for the safety of the Nation, not on true conservation principles, but on the principle of price maintenance."

If the department succeeds in the suit, it was predicted, "independent producers should receive higher prices for their crude oil, and independent refiners should be able to compete with the major oil companies. With competition restored to the oil industry, gasoline, fuel oils, kerosene and lubricants should be sold at lower prices to the consumer who should then receive the benefits of technological improvements, and the opportunity to purchase a variety of products. Lower prices for petroleum products are of great importance to the government in its defense program. Finally the production of oil should then be determined not on the basis of price maintenance but on true conservation principles."

U. S. Chamber Holds for State Rule; Oppose Disintegration

Conservation of petroleum resources through state effort rather than by federal control was held last week by the board of directors of the United States Chamber of Commerce to be the soundest policy "not only as a peacetime measure but as assuring maximum efficiency of the industry for defense."

The position of the organization's directorate was taken at its fall meeting September 27, when it approved a report of the natural resources production department committee, reviewing current conditions in the oil industry.

"There is general agreement that our reserves of crude petroleum are adequate for all purposes, provided there is no decrease in exploration for new fields, that certain readjustments are anticipated in the distribution of crude for producing special commodities, and that the government does not start law suits that would disrupt the orderly progress of the industry," the report declared.

"The unquestioned high standing of the American petroleum industry among the industries of the world needs no amplification. In cheapness, quality and availability, it surpasses all other countries and in technical development it has been an acknowledged leader from the inception of the industry—and this has all been accomplished by private industry."

Rapid progress has been made in perfecting plans for the accumulation and acquiring aviation gasoline for defense, the committee found, adding that "there apparently is no occasion for solicitude as to adequate supplies of this vital material."

The committee took a strong position in opposition to any government suit against the oil industry which would involve disintegration, declaring that "it is not difficult to see how such a suit would open up a wide field of litigation that would bring uncertainty in many directions, and impede defense preparations." It pointed out, also, that the National Defense Advisory Commission had expressed similar views in its report to the Attorney General on the plan of the anti-trust division of the Department of Justice to bring the question of divestiture before the courts.

Allowables

October Allowables Will Permit Over-production

National over-production of at least 30,000 barrels of crude daily is indicated for October by the program of allowables in the prorated states.

This prospect was indicated in these columns last week in a tabulation that embodied some official and several estimated figures on state allowables; and it is essentially confirmed by the accompanying table in which finally adopted allowables are shown.

Small Over-production in Prorated States Under October Allowables Will Be Largely Offset by Inability of Illinois to Fulfill Demand

(Barrels Daily)

STATE	Bureau of Mines Estimate of Demand	State Allowable Beginning of Month	Excess or Deficiency of State Allowable	Percent Excess or Deficiency
Arkansas	70,700	68,743	— 1,957	— 2.7
California	583,200	[1]571,000	—12,200	— 2.1
Kansas	178,700	[2]190,000	+11,300	+ 6.3
Louisiana	274,200	269,631	— 4,569	— 1.7
Michigan	53,900	[3]47,000	— 6,900	— 12.8
New Mexico	104,500	104,500	.....	.....
Oklahoma	403,500	390,000	—13,500	— 3.3
Texas	1,305,200	[4]1,376,793	+71,593	+ 5.4
Total 8 Prorated States	2,973,900	[5]3,017,667	+43,767	+ 1.4
Illinois	405,200	[5]361,350	[6]—43,850	— 10.8
Other States	201,500	.....	.....	.....
Total United States	3,580,600	.....	.....	.....

[1] Recommendation of Central Committee of California Oil Producers.
[2] Kansas conservation authorities indicated that allowable likely would be set around 190,000 barrels.
[3] Estimate of actual production that will occur under prescribed regulations, which do not fix a definite state total allowable.
[4] Net basic daily allowable as of September 29. Texas fields will be shut down October 5, 6, 12, 13, 19, 20, 26, 27 and 31, under previously issued order, and net allowable will increase with completions of new wells.
[5] Level to which unprorated Illinois production had naturally declined in week ended September 28, 1940.
[6] Amount by which actual production fell below indicated market demand in week ended September 28, 1940.

The 8 prorated states, Arkansas, California, Kansas, Louisiana, Michigan, New Mexico, Oklahoma and Texas, have October allowables which in the aggregate are 43,767 barrels daily, or 1.4 percent, in excess of indicated market demand as estimated by the United States Bureau of Mines. However, California's state allowable is about 12,000 barrels under demand, yet the state heretofore has been rather consistently over-producing indicated demand about 20,000 barrels daily. Hence, the 8 states together probably will over-produce at least 75,000 barrels daily.

That excess should be partially offset, however, by under-production in Illinois, which lately has been failing by about 45,000 barrels daily to fulfill market demand.

The net national excess of about 30,000 barrels daily indicated by these figures would amount to approximately 1,000,000 barrels for the month.

Texas Allowable Above Bureau Demand Figure

Special allowable increases granted by the Texas Railroad Commission brought the state's new allowable to 1,376,793 barrels daily for the week ended September 29, to a point 56,493 barrels above the September estimate of consumer demand set by the United States Bureau of Mines.

A drop of 15,000 barrels in the Bureau's estimate for October and further increases granted during the past week brought the state's net allowable to more than 75,000 barrels above the current demand figure.

Increases granted last week raised the Louise field, Wharton County; Guerra field, Starr County; Emperor Deep field, Winkler County; Clay Creek field, Washington County; Ganado field, Jackson County, and a single well in Harris County. A decrease was ordered for Old Ocean field, Brazoria County.

Remand Action on Approved Lease Extension Measure

Without debate, the Senate on September 30 approved a bill previously passed by the House providing for extension of certain oil and gas prospecting permits, only to find the following day that such an extension was granted three years ago, at which time the President had announced he would not approve any further continuance of the same permits.

Bringing the situation to the attention of the Senate October 1, Majority Floor Leader Barkley secured reconsideration of the vote and restoration of the bill to the calendar, where action on it was indefinitely postponed.

The bill provided that, notwithstanding any provisions of later laws, any permit issued under the leasing act of 1920 which expired between December 31, 1937, and January 1, 1940, because of lack of authority under existing laws to make extensions and under which the permittee in good faith had complied with all requirements, may be extended for an additional period ending December 31, 1941, by the Secretary of the Interior upon application by the permittee.

World-Wide Developments

House Kills Bill Aimed at Mexican Oil Imports

Unexpected opposition in the House, which saw in the measure a weapon which could be applied against nations with which the United States has no quarrel, resulted in defeat October 1, by a vote of 129 to 123, of the Sumners bill giving the President discretionary authority to prohibit importation of property confiscated by foreign governments.

Primarily intended to close the doors to oil from American properties expropriated by the Mexican government, the bill evoked adverse sentiment when it became apparent that it went far beyond that point. Opposition to the measure was not allayed by the vigorous refusal of proponents against amendments which would limit the application of the legislation to American properties confiscated by foreign governments.

The bill sponsored by Representative Hatton W. Sumners, chairman of the committee appointed at a caucus of the Texas delegation to develop legislation to halt importation of Mexican oil, was offered as a substitute for for a bill introduced by Senator Morris Sheppard and passed by the Senate, broadening the scope of the National Stolen Property Act to divest of their interstate or foreign character goods which have been seized in violation of law or confiscated.

Opposition of the State Department halted the progress of the Sheppard bill when it reached the House, but the Sumners bill, which merely authorized the President in his discretion to embargo the importation of confiscated property if it had not been paid for or satisfactory arrangements for its payment had not been made, was held by the department to be unobjectionable.

Despite strong support given the bill by leading members of the House, opposition gained momentum when it was pointed out by Representative Cochran that the legislation would not be limited to property of American nationals taken over by a foreign government but could be applied to any property of any national taken over by any government.

He was joined by Representative Michener, who asserted that he read the bill to mean that the President, if he saw fit, could issue a finding to the effect that properties of the French people or British subjects had been taken over by their governments and therefore should be denied entry into the United States.

Other members contended that, to be consistent in barring the importation of oil from Mexico under the bill, the President would have also to impose a general embargo on imports from Russia.

Members of the House were urged by Representative Sumners not to kill the bill, which he explained would open the way for a quick solution of the Mexican oil problem.

"Everybody knows that the oil producers of America are being put to great disadvantage by the importation of this oil," he declared, adding that invocation of the anti-dumping provisions of the tariff act would not meet the situation because "they are not selling it any cheaper in this country than where produced."

A motion to recommit the bill to the committee with instructions to amend it to apply more directly and solely to the Mexican situation was defeated by a vote of 142 to 119.

Walkout May Cancel Mexican Labor Contract

There was considerable speculation in Mexico City as the week closed as to whether a walkout of several hundred workers at the Atzcapotzalco refinery in protest of the discharge of 285 employes could be used as legal justification for cancellation of the labor contract which the government oil administration is desirous of breaking.

Under Mexican law, a labor contract can be declared unbinding if either party violates it.

The 285 men were discharged as a preliminary step in putting into force President Cardenas' economy program designed to wipe out the 68,000,000-peso deficit piled up by the Mexican oil industry since operation of that industry was taken out of the hands of private enterprise by expropriation. The walkout took place September 28.

Officials of the Petroleum Workers Union were quoted as saying they hoped the president would advise the oil administration to withdraw the demand that the Federal Labor Board declare contracts with the oil workers null and void because of the walkout.

Arrange to Boost Russian Shipments to Germany

During the month ending September 13, slightly less than 20,000 tons of oil moved from Russia through Varna, Bulgaria, en route to Germany, according to C. L. Sulzberger. Shipments, however, have been speeded up to 4045 tons a week and the amount transported during the month ending October 13 exceed the 20,000-ton figure.

The routing of the oil from the Russian fields in the Caucasus is across the Black Sea to Varna, thence by rail across Bulgaria, Yugoslavia and Hungary. Three tankers are running regular schedules to bring the oil to Varna from Batum. They are classed as 5000-ton tankers, and said to be under charter to the Reich for $15,000 per month each. Two trains of 25 to 30 tank cars leave Varna daily, and with gradual acquisition of new tank cars from Sweden and old ones from German-occupied countries, the Reich hopes to step up transportation of oil over this route to 700,000 tons per year, despite the fact that the track between Varna and Russe, a Bulgarian river port opposite Giurgui, which is the Rumanian terminus of the Ploesti pipe lines, remains a single track.

One step in increasing transportation along the Varna route has been completion at Varna of one new 10,000-ton storage tank; another of similar size is under construction. Another development, which may have the increasing of runs from Batum to Varna in mind, is the fact that German engineers are in the Caucasus studying means of increasing the output of those Russian fields.

Another route is being used to move Russian oil to Germany. Quantities of oil are passing along the Soviet inland waterways from the Black Sea to the German border. Pravda, the Communist newspaper at Moscow, reported recently that tankers built in Russia for the transportation of oil products from the Black Sea, travel up the Dneiper River via Kiev and thence by way of the Dneiper-Bug Canal on the way to the "western city of Brest."

Originally, the Reich planned to use the Danube for shipment of Russian oil into Germany, but this artery is filled to capacity with traffic from Rumania consisting principally of oil from the Ploesti pipe lines.

Sabotage Blamed for Derailing Of Germany-Bound Oil Train

A train of loaded tank cars en route from Rumania to Germany was derailed between Zagreb, Yugloslavia, and Lubjlana, September 28, as a result of what police believe to have been an act of sabotage.

Associations

Committees Named for Texas Mid-Continent Convention

Committees to arrange details of the twenty-first annual convention of the Texas Mid-Continent Oil & Gas Association, to be held October 31 to November 2 at Fort Worth, were appointed Saturday from members of the Fort Worth oil group by W. A. Moncrief, general convention chairman.

In charge of the annual handicap golf tournament, in which teams from 30 Texas oil cities are expected to compete, is J. A. Gooch. He will be assisted by R. A. Brewer, G. H. Chizum, Bert Honea, R. W. McIlvain, Jr., and H. B. Fuqua. Not only the W. B. Hamilton trophy for the low net score, but also dozens of other prizes given by the Fort Worth committee will reward top-flight golfers.

A general entertainment committee was appointed with Raymond Gee as chairman, comprising E. A. Landreth, Houston Hill, H. S. Cole, Jr., John Farrell, James Snowden, Marshall Young, Harold Neely, Charles F. Roeser and Jack Herbert. F. J. Adams was named chairman of the reception committee, with Sid W. Richardson, A. J. Armstrong, William Fleming, Edward Hudson, Paul McDermott, Rice Tilley, J. C. Halbert, R. O. Dulaney, P. W. Riggins and Roy Westbrook as members.

Plans for celebration of the forty-fifth anniversary of the birth of the Texas oil industry, which furnishes the theme of the convention, will be made by a committee composed of John W. Naylor, Boyce House, Clarence Burk and R. E. Hardwicke.

Gasoline Withdrawal Small As Refineries Stay Busy

Latest statistics of the industry have reflected wide fluctuations in crude oil production because of the Texas shutdown system of proration, continued excessive crude runs to stills, further large production of gasoline, another subnormal withdrawal of gasoline from storage, further accumulation of light fuel oil which probably will be needed during the winter, and a slight addition of heavy fuel oil to storage, also a satisfactory development.

United States crude oil production temporarily jumped to the high average of 3,799,950 barrels daily in the week ended September 28, the American Petroleum Institute reported, an increase of 178,950 barrels over the rate in the previous week; and at the new level was 175,000 barrels above market demand, as estimated for September by the United States Bureau of Mines. However, the sharp increase was due wholly to a similar jump in Texas output, which occurred because only one shutdown day fell within the week. The temporary increase was due to be compensated, however, by a similarly sharp cut-back in Texas production in the week ended October 5.

THE OIL WEEKLY's estimates of production for the week of October 5 indicate that Texas output dropped to 1,186,800 barrels daily for that period, a decline of 330,500 barrels; and that the sharp decrease brought both the state and the nation below market demand for the week. Thus for the two weeks, ended September 28 and October 5, in the aggregate, both Texas and the nation produced approximately in conformity with market demand.

Crude runs to stills in the United States had been within 10,000 barrels of the all-time peak in averaging 3,680,000 barrels daily in the week ended September 21, and consequently, refinery operations were not satisfactorily adjusted even by the large drop to 3,600,000 barrels daily for the week of September 28. Economists have figured that runs averaging only 3,400,000 barrels daily during the fall and winter would be needed to result in an economic level of gasoline stocks at the end of the period.

The curtailment of runs to stills in the week ended September 28 made possible the manufacture of 303,000 barrels less gasoline than in the preceding 7 days, the plant output having dropped to 11,832,000 barrels.

However, the production was comparatively large, and it permitted the withdrawal of only the subnormal amount of 587,000 barrels of gasoline from excessive storage. The national inventory of finished and unfinished gasoline then stood at 82,373,000 barrels on September 28. That quantity was about 18,000,000 barrels greater than the amount regarded by economists as minimum working stock requirements at the end of September, after which gasoline normally accumulates in storage.

The present stocks of gasoline are more than 11,000,000 barrels greater than those held at this time last year, and out of the year-ago stocks developed year-long weakness of the gasoline market.

Stocks of gas oil and distillate fuel, consisting largely of heating oil, were further increased 823,000 barrels to 47,986,000 barrels, in the week ended September 28. The present inventory apparently assures adequate supplies in addition to current production for meeting the anticipated heavy demand this winter. Heavy fuel oil stocks also were increased, having risen 259,000 barrels, to a total of 108,450,000 barrels on September 28.

Crude oil stocks declined from 262,475,000 to 262,209,000 barrels in the week ended September 21, the bureau reported.

Crude Markets Firm and Products Remain Steady

The industry's markets continue relatively firm in the oil fields and down the line to the retail outlets of refined products.

Price changes have been rare in the past few weeks, and revisions last week were limited chiefly to a ¼-cent mark-up of quotations on natural gasoline and to advances of ⅛ cent a gallon on the minimum wholesale prices of gasoline at New York and some other Atlantic seaboard points, which partially reflected further increases in domestic tanker rates.

Offers of distress crude oil on the Gulf Coast are steadily dwindling. In explanation, it is stated that possibly the decline of Illinois production is making it possible for more oil to move from the Gulf to the Atlantic seaboard.

The Illinois decline probably is indirectly giving the East Texas field an expanded market. One major purchaser appears particularly desirous of obtaining more East Texas crude, after having diverted northward a large proportion of its Oklahoma runs and more recently a portion of its North Texas high-gravity crude.

West Texas and New Mexico are still on a healthy basis, with major purchasers readily taking the production permitted under present allowables.

Oklahoma and Kansas naturally are benefiting marketwise from the giving up of markets by Illinois, which no longer is able to produce as much crude as the markets would absorb; although Kansas has taken some chance with the stability of its markets by permitting production in excess of market demand as estimated by the United States Bureau of Mines.

Kansas late last week was still delaying action on the setting of an allowable for October, although officials of the state had intimated that the 190,000-barrel daily allowable of September would be approximately duplicated for October. The bureau estimated Kansas demand at 170,700 barrels daily for September and at 178,700 for October. The state did not develop any serious market troubles in September by as-

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,800	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[1]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[3]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[3]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 7	3,623,850	3,500,000	262,716,000	84,294,000	45,505,000	108,080,000
September 14	3,647,400	3,580,000	262,475,000	83,300,000	46,648,000	109,135,000
September 21	3,621,000	3,680,000	262,209,000	82,960,000	47,163,000	108,191,000
September 28, 1940	3,799,950	3,600,000	.....	82,373,000	[4]47,986,000	108,450,000
September 28, 1939	3,658,200	[8]3,517,000	[4]232,811,000	71,082,000	38,104,000	114,246,000
Change in past year	+3.7%	+2.4%	—11.2%	+15.9%	+25.9%	—5.1%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, September 23, 1939.
[5] Lowest since October, 1922, due to shutdown of six Mid-Continent States. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] September, 1939, daily average.

suming that the federal agency was too conservative in its estimate, in view of the Illinois situation. Consequently, the contemplated action for October did not raise any serious threat to the state's crude market situation.

Although there have been in the past few months some evidences of weakness in the markets for Arkansas crudes, improvement has been attested by recent developments. Standard Oil Company of Louisiana September 27 became a purchaser of Schuler and Jones-sand crude, having posted a top price of 95 cents a barrel, the same as posted by Lion Oil Refining Company but 10 cents higher than the postings established recently by Root Petroleum Company through a 10-cent cut. Standard will take about 4000 barrels daily through Phillips Petroleum Company pipe lines. With a top price of 95 cents for 40-gravity and above, the schedule of postings calls for a 2-cent differential down to a bottom price of 63 cents for 25-gravity and below.

On October 2, Phillips Petroleum Company announced that retroactive to September 27 it raised the price for Jones-sand crude at Schuler 12 cents a barrel. The company's new prices equaled those of Standard of Louisiana. Meanwhile, Root Petroleum continued to pay 10 cents a barrel less than the Standard-Phillips prices.

Pan American Pipe Line Company effective October 1 made initial postings for two Texas Gulf Coast fields. Hastings and South Houston crudes were placed on the same schedule of prices paid by other major purchasers for similar crudes in other coastal Texas fields, such as Barbers Hill, Blue Ridge, and so forth. The postings begin with 88 cents for below 21-gravity, and extend upward by 2-cent differentials to a top price of $1.28 for 40-gravity and above.

Tanker rates from the Gulf to the Atlantic seaboard last week continued the advance that had gotten under way the previous week.

Owners were asking 2 cents a barrel more than last paid rates, following an

Wholesale Prices of Refined Products

	Range late Last Week (Cents a gal.)		Changes from week Before	
REFINED GASOLINE				
Oklahoma Refineries:				
60 Octane and under	3⅞	4¼	...	...
63-66 Octane	4¼	4¾	...	...
72-74 Octane	4⅝	5¼	...	...
Mid-Western Tank Car:				
60 Octane and under	3⅞	4¼	...	...
63-66 Octane	4¼	4¾	...	...
72-74 Octane	4⅝	5	...	...
New York Harbor:				
68-70 Octane	5	5½	+⅛	...
72-74 Octane	5	6½	+⅛	...
Gulf Coast:				
60 Octane unleaded	3⅝	4½	...	...
72-74 Octane leaded	3¾	4¾	+¼	...
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	2¼	2½	...	+¼
F.O.B. Breckenridge, Texas	2	2	+¼	+¼
KEROSENE				
Oklahoma Refineries:				
41-43 water white	3⅞	4¼	...	...
42-44 water white	4	4⅝	...	...
Mid-Western Tank Car:				
41-43 water white	3⅞	4¼	...	...
42-44 water white	4	4⅝	...	...
New York Harbor	4¾	4¾	...	...
RANGE OIL				
At Oklahoma Refineries	3½	3⅞	...	...
In Mid-Western Market, Group 3 basis	3½	3⅞	...	...
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3¼	3½	...	...
No. 3	3⅛	3⅜	...	...
Mid-Western Tank Car:				
No. 1 white	3¾	3¾	...	...
No. 3	3⅛	3⅜	...	...
New York Harbor:				
No. 1	4¾	4¾	...	...
No. 3	4⅛	4⅛	...	...

	Range late Last Week (Per Bbl.)		Changes from week Before	
HEAVY FUEL OILS				
Oklahoma Refineries:				
No. 6	$0.55	$0.55	...	...
Mid-Western Tank Car:				
No. 5	.75	.75	...	...
No. 6	.50	.55	...	...
New York Harbor:				
No. 5	1.35	1.55	...	...
No. 6	1.15	1.25	...	...
BUNKER C FUEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$ .80	$ .90	...	...
New York Harbor	1.15	1.25	...	...
DIESEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$1.50	$1.70	...	...
New York Harbor	1.70	1.70	...	...
Los Angeles Basin, 27 gravity	1.10	1.35	...	...
LUBRICATING OIL (Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	13	15½	...	...
Neutral oil, pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	8	10¼	...	...
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	12	13	...	...
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	19	19	...	...

United States Crude Oil Production Down Sharply

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (October)	State Allowable in Oct.	BARRELS DAILY FOR WEEK ENDED Sept. 28	Oct. 5
TEXAS—				
Texas Panhandle	.....	.....	79,150	80,900
North Texas	.....	.....	134,200	121,200
West Central Texas	.....	.....	32,675	29,000
West Texas	.....	.....	253,850	207,800
East Central Texas	.....	.....	77,950	62,800
East Texas Field	.....	.....	448,100	299,100
South Texas	.....	.....	243,575	198,400
Texas Gulf Coast	.....	.....	246,725	187,600
Total Texas	1,305,200	1,376,793*	1,516,225	1,186,800
CALIFORNIA—				
Long Beach	.....	.....	43,100	42,900
Midway-Sunset	.....	.....	38,300	50,900
Kettleman Hills	.....	.....	47,200	46,100
Wilmington	.....	.....	81,600	81,200
Others	.....	.....	377,700	379,100
Total California	583,200	571,000†	587,900	600,200
OKLAHOMA—				
Oklahoma City	.....	.....	94,850	109,000
Seminole Area	.....	.....	97,350	106,500
Others	.....	.....	211,725	200,600
Total Oklahoma	403,500	390,000	403,925	416,100
ILLINOIS—				
Salem	.....	.....	147,200	148,900
Louden	.....	.....	69,500	74,000
Centralia	.....	.....	21,500	21,900
Other New Pools	.....	.....	100,500	101,500
Old Pools	.....	.....	10,300	10,400
Total Illinois	405,200	.....	349,000	356,700

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (October)	State Allowable in Oct.	BARRELS DAILY FOR WEEK ENDED Sept. 28	Oct. 5
LOUISIANA—				
North Louisiana	.....	60,226	65,200	64,500
South Louisiana	.....	209,405	218,900	221,300
Total Louisiana	274,200	269,631	284,100	285,800
KANSAS	178,700	190,000‡	193,550	191,150
NEW MEXICO	104,500	104,500	98,700	99,500
EASTERN STATES—				
Pennsylvania Grade	66,200	.....	70,050	69,200
Others, Eastern	20,200	.....	20,050	21,100
Total Eastern States	86,400	.....	90,100	90,300
MOUNTAIN STATES—				
Wyoming	75,200	.....	74,100	77,200
Montana	17,700	.....	17,400	17,200
Colorado	3,900	.....	3,450	3,500
Total Mountain States	96,800	.....	94,950	97,900
MICHIGAN	53,900	47,000§	51,250	50,500
ARKANSAS	70,700	68,743	72,900	70,500
INDIANA	9,300	.....	17,900	17,700
MISSISSIPPI	9,000	.....	22,850	19,300
NEBRASKA	.....	.....	250	1,050
¶Total 8 Prorated States	2,973,900	3,017,667	3,208,350	2,900,550
Total United States	3,580,600	.....	3,783,600	3,483,500

* Net basic daily allowable as of September 29. Texas fields will be shut down October 5, 6, 12, 13, 19, 20, 26, 27 and 31, under previously issued order, and net allowable will increase with completions of new wells.
† Recommendation of Central Committee of California Oil Producers.
‡ Kansas conservation authorities indicated that allowable likely would be set around 190,000 barrels.
§ Estimate of actual production that will occur under prescribed regulations, which do not fix a definite state total allowable.
¶ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.

advance of 2 cents on clean boats within the week and an increase of 1 cent the previous week.

Last paid rates for clean boats were 21 cents for gasoline, 22 cents for kerosene, and 23 cents for No. 2 fuel oil.

The rates last paid for dirty boats were 1 cent higher than previously, at 19 cents for 30-gravity or lighter crude and 21 cents for 10-20-gravity fuel oil.

Refined Products

Wholesale prices of refined petroleum products last week were generally the same as in the previous week.

Demand for gasoline was reported better than generally expected, and prices were steady despite the burdensome stocks that were on hand.

The approach of colder weather is stimulating interest in heating oils, while kerosene and tractor fuels are in good demand for fall use on farms.

Heavy fuel oils also remain firm, as demand is stimulated by the continued expansion of industrial activity.

Planning Underground Tanks For Defense Gasoline Storage

Oil company engineers and tank builders have been conferring at Washington with government officials with regard to storage facilities for 7,500,000 barrels of aviation gasoline, to be provided by the government under the national defense program.

It is understood that plans call for rimming the nation with aviation gasoline depots, possibly averaging about 5 tanks of 27,500 barrels capacity each, and for similarly placing additional depots at interior points.

Pipe Lines

Pan American Announces 195-Mile Pipe Line Project

Pan American Pipe Line Company last week announced a pipe-line project involving 195 miles of 10- and 12-inch pipe to connect the East Texas field with the company's refinery at Texas city. (See THE OIL WEEKLY, September 23, page 187.)

A 58-mile 10-inch trunk line will be laid from East Texas to a point near Douglas, where it will intersect with a branch line from Cayuga. From this point, oil will move through a 137-mile 10-inch carrier to Sinco, east of Houston. Work on the line started last week. The completed projected will include gathering facilities in East Texas, part of which will be constructed and part purchased.

The company has a 12-inch trunk line from Sinco to its refinery, now serving the Gillock and South Houston fields, as well as an 8-inch line with gathering facilities from Hastings to Texas City.

The line is being constructed so that the company may handle through its own facilities East Texas oil purchased by Stanolind Oil Purchasing Company and delivered to the Texas City refinery through combined facilities of Humble Pipe Line Company, Stanolind Pipe Line Company and Pan American Pipe Line Company, as well as Cayuga crude being purchased by Pan American and delivered through Stanolind Pipe Line Company's facilities to Sinco.

Gulf Welding Screw Collars On West Texas 10-Inch Line

Gulf Refining Company, Pipe Line Division, is welding collars on 99 miles of its original West Texas 10-inch trunk line between Midland and Ranger Stations. Threaded pipe was used in the construction of this carrier in 1927. The collar welds are being made as a precaution against the hydrogen sulphide content of the crude eventually destroying the pipe threads. The line will continue in operation while the work is underway.

Bell Pipe Line Company Starts Falls City Line

Bell Pipe Line Company last week started work on a 4½-inch pipe line to connect the Falls City pool of Nebraska to a spur-track loading rack on the C. B. & Q. at Falls City. The line will be combination gravity and high-pressure, with Diesel pumps to be installed to handle the volume ultimately expected.

The company plans to post a price of 80 cents a barrel for crude, which is 31.5-gravity

Union Pipe Line Company is stringing pipe for a gathering system in the pool.

CALIFORNIA CRUDE OIL PRICES

Posted effective February 1, 1940. All gravities above those quoted take highest price offered in that field.

Gravity	Wilmington	Signal Hill (Long Beach) El Segundo	Seal Beach	Huntington Beach	Inglewood	Playa del Rey	Olinda, Brea, Canon	Athens-Rosecrans	Elwood Terrace	Torrance	Richfield	Whittier, East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Newhall, McKittrick, Kern River, Round Mt., Kern Front	Greeley Canal	Colea Levee, Richfield Western	Mountain View	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills
14-14.9	$0.60	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	$0.60	....	....	....	$0.60	$0.60	$0.60	....	....
15-15.9	.60	.65	.64	.63	.64	.65	.61	....	....	.65	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
16-16.9	.60	.65	.64	.63	.64	.65	.61	....	....	.65	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
17-17.9	.62	.65	.64	.63	.68	.65	.61	....	....	.65	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
18-18.9	.64	.65	.64	.63	.71	.65	.65	....	....	.68	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
19-19.9	.69	.69	.64	.67	.75	.70	.69	....	....	.72	.61	.65	.62	.63	....	.60	....	....	$0.60	.64	.64	.61	$0.60	....
20-20.9	.73	.73	.64	.72	.79	.76	.74	....	....	.75	.65	.69	.62	.67	....	....	....	....	.60	.69	.69	.62	.60	....
21-21.9	.78	.78	.64	.76	.82	.81	.78	....	....	.79	.69	.73	.62	.72	$0.63	....	....	....	.64	.74	.74	.66	.60	....
22-22.9	.82	.82	.69	.81	.86	.86	.82	....	....	.82	.73	.77	.66	.76	.63	....	....	....	.68	.79	.78	.70	.63	....
23-23.9	.86	.86	.75	.85	.89	.92	.86	$0.71	....	.86	.78	.82	.71	.81	.67	....	....	....	.71	.84	.82	.74	.67	....
24-24.9	.90	.90	.80	.90	.93	.97	.90	.77	....	.89	.82	.86	.75	.85	.72	....	....	....	.75	.89	.86	.78	.71	....
25-25.9	.95	.95	.86	.94	.96	1.02	.95	.82	....	.93	.86	.90	.80	.89	.77	....	....	....	.79	.94	.90	.82	.75	....
26-26.9	.99	.99	.91	.99	1.00	1.08	.99	.88	....	.96	.90	.94	.84	.94	.82	....	....	....	.83	.99	.95	....	....	....
27-27.9	1.03	1.03	.97	1.03	1.04	F.O.B.	1.03	.94	....	1.00	.94	.98	.89	.98	.87	....	$0.83	$0.92	.87	1.04	.99	....	....	....
28-28.9	1.07	1.07	1.02	1.07	1.07	Pipe Line	1.07	.99	....	1.03	.98	....	.93	1.02	.91	....	.86	.96	.91	1.09	1.03	....	....	....
29-29.9	1.10	1.10	1.07	1.11	1.10	....	1.10	1.04	....	1.06	1.02	....	.98	1.06	.96	....	.90	.99	.95	1.14	1.07	....	....	....
30-30.9	1.14	1.14	1.12	1.15	1.14	....	1.14	1.09	F.O.B.	1.09	....	....	1.02	1.10	1.01	....	.94	1.02	.99	1.19	1.11	....	....	....
31-31.9	....	....	....	....	1.17	....	1.17	1.14	Ship	....	....	....	1.07	1.14	1.05	....	.98	1.06	1.02	1.24	....	....	....	....
32-32.9	....	....	....	....	1.20	....	1.20	1.19	....	....	....	....	1.11	1.18	1.09	....	1.02	1.09	1.06	1.29	..	....	....	....
33-33.9	....	....	....	....	....	....	....	1.24	$1.21	....	....	....	1.15	1.22	1.14	....	1.06	1.13	1.10	1.34	..	....	....	$1.12
34-34.9	....	....	....	....	....	....	....	1.29	1.25	....	....	....	1.20	1.26	1.19	....	1.10	1.16	1.14	....	....	....	....	1.17
35-35.9	....	....	....	....	....	....	....	1.34	1.29	....	....	....	1.24	....	1.23	....	1.14	1.20	....	....	....	....	....	1.21
36-36.9	....	....	....	....	....	....	....	1.39	1.33	....	....	....	1.28	....	1.27	....	1.18	1.23	....	....	....	....	....	1.25
37-37.9	....	....	....	....	....	....	....	1.44	1.37	....	....	....	1.33	....	1.31	....	1.22	1.26	....	....	....	....	....	1.29
38-38.9	....	....	....	....	....	....	....	1.49	....	....	....	....	1.37	....	1.36	....	1.25	1.30	....	....	....	....	....	1.33
39-39.9	....	....	....	....	....	....	....	1.54	....	....	....	....	1.42	....	....	....	1.29	1.34	....	....	....	....	....	1.38
40-40.9	....	....	....	....	....	....	....	1.59	....	....	....	....	1.46	....	....	....	1.33	1.37	....	....	....	....	....	....
41-41.9	....	....	....	....	....	....	....	....	....	....	....	....	1.50	....	....	....	1.37	1.40	....	....	....	....	....	....
42-42.9	....	....	....	....	....	....	....	....	....	....	....	....	1.54	....	....	....	1.41	1.44	....	....	....	....	....	....
43-43.9	....	....	....	....	....	....	....	....	....	....	....	....	1.59	....	....	....	1.45	1.47	....	....	....	....	....	....
44-44.9	....	....	....	....	....	....	....	....	....	....	....	....	1.63	....	....	....	1.49	1.51	....	....	....	....	....	....
45-45.9	....	....	....	....	....	....	....	....	....	....	....	....	1.67	....	....	....	1.53	1.54	....	....	....	....	....	....
46-46.9	....	....	....	....	....	....	....	....	....	....	....	....	1.71	....	....	....	1.57	1.57	....	....	....	....	....	....
47-47.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.61	....	....	....	....	....	....	....
48-48.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.64	....	....	....	....	....	....	....

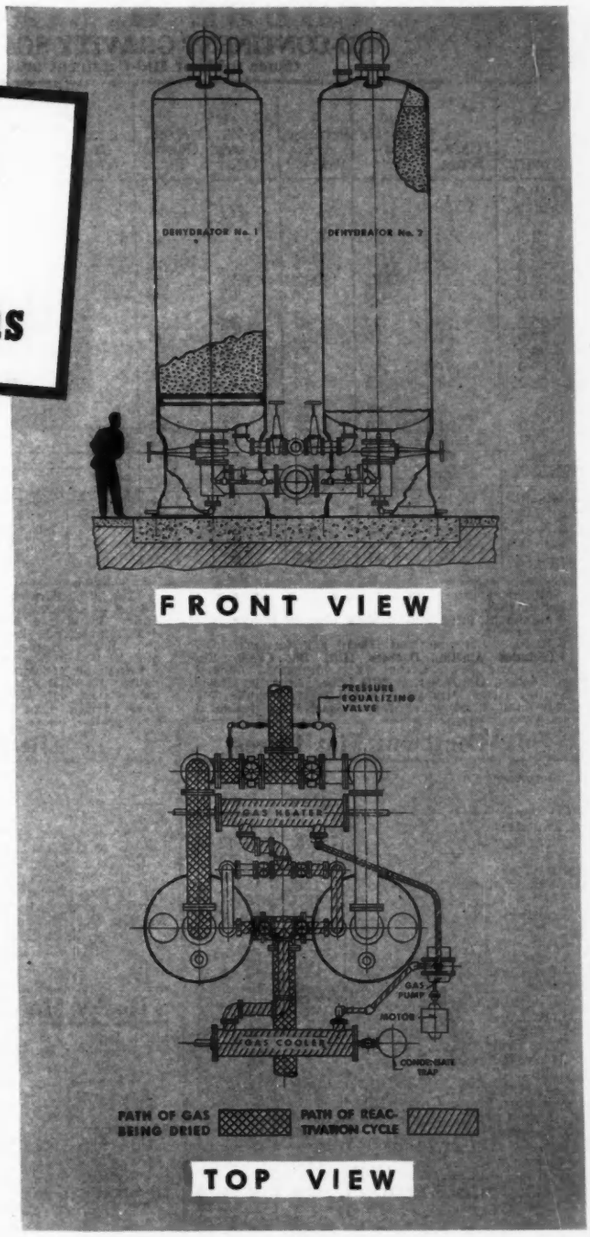
This is the easy way to lick your Valve Freeze-up Problems

Illustrated at the right is the principle on which Activated Alumina is used to dehydrate natural gas at high pressures. Single units are removing water from 25,000,000 cubic feet of gas a day.

Note how simple this apparatus is. No solutions, evaporators, or moving parts are used. The equipment works at line pressure. The Activated Alumina contained in the towers lasts indefinitely when handled properly. The installation requires at most only a few minutes attention each day, and can be made wholly automatic.

The benefits obtained are positive. Removing water from the gas not only prevents valve freeze-ups and hydrate formation, but also eliminates the cause of internal corrosion of lines and other equipment. The result is cheaper, surer, more satisfactory operation of pipe lines and equipment.

We shall be glad to send you more information about the use of Activated Alumina in operation of pipe lines, natural gasoline recovery plants, and drying organic liquids. Write to ALUMINUM COMPANY OF AMERICA (*Sales Agent for* ALUMINUM ORE COMPANY) 1962 Gulf Building, Pittsburgh, Pa.



EQUIPMENT designed to dry natural gas continuously at the rate of 25,000,000 cu. ft. per day. Pressure 250 pounds. Gas contains 11 grains of moisture per cubic foot, equal to saturation at 80° F. Final dew point: minus 60° F. Installations now in operation reach dew points below minus 76° F.

ACTIVATED ALUMINA

AN "ALORCO" ALORCO PRODUCT

CRUDE OIL PRICE SCHEDULES

MID-CONTINENT GRAVITY SCALE PRICES—Posted October 11-13, 1938

(Some fields of Mid-Continent have flat price postings, and are shown separately)

Gravity	[7]Okla.-Kans.	[10]North La.-Ark.	[9]Schuler, Ark. 9-13-39	North & W. Central Tex.	East Central Tex.	Gray Co. Tex.	Carson, Hutchinson Co. Tex.	[1]Tomball, Tex. Type	West Tex.-New Mex.	[2]Gulf Coast (Tex.-La.) 10-2-39	[3]Some La. Gulf Areas 10-2-39	Jennings, La.	[4]Anahuac, Tex. Type 10-2-39	[5]Refugio, Tex. Type 10-2-39	[6]Mirando, Tex. Type 10-2-39	[8]Salt Creek, Wyo. (except Tensleep)
19–19.9	.....	.....	.....	.....	.....	.....	.....	.....	*$0.53	*$0.86	*$0.86	.....	*$0.81	*$0.91	*$0.86	.....
20–20.9	$0.60	.....	.....	.....	.....	.....	.....	.....	.55	.88	.88	.....	.83	.93	.88	$0.70
21–21.9	.63	.....	.....	.....	.....	.....	.....	.....	.57	.90	.90	.....	.85	.95	.90	.72
22–22.9	.66	.....	.....	.....	.....	.....	.....	*$0.95	.59	.92	.92	.....	.87	.97	.92	.74
23–23.9	.69	.....	.....	.....	*$0.78	.....	.....	.97	.61	.94	.94	.....	.89	.99	.94	.76
24–24.9	.72	*$0.73	*$0.63	*$0.71	.80	.....	.....	.99	.63	.96	.96	.....	.91	1.01	.96	.78
25–25.9	.75	.75	.65	.73	.82	.....	.....	1.01	.65	.98	.98	.....	.93	1.03	.98	.80
26–26.9	.78	.77	.67	.75	.84	.....	.....	1.03	.67	1.00	1.00	.....	.95	1.05	1.00	.82
27–27.9	.81	.79	.69	.77	.86	.....	.....	1.05	.69	1.02	1.02	.....	.97	1.07	1.02	.84
28–28.9	.84	.81	.71	.79	.88	*$0.72	*$0.67	1.07	.71	1.04	1.04	.....	.99	1.09	1.04	.86
29–29.9	.87	.83	.73	.81	.90	.74	.69	1.09	.73	1.06	1.06	.....	1.01	1.11	1.06	.88
30–30.9	.90	.85	.75	.83	.92	.76	.71	1.11	.75	1.08	1.08	.....	1.03	1.13	1.08	.90
31–31.9	.92	.87	.77	.85	.94	.78	.73	1.13	.77	1.10	1.10	*$0.87	1.05	1.15	1.10	.92
32–32.9	.94	.89	.79	.87	.96	.80	.75	1.15	.79	1.12	1.12	.89	1.07	1.17	1.12	.94
33–33.9	.96	.91	.81	.89	.98	.82	.77	1.17	.81	1.14	1.14	.91	1.09	1.19	1.14	.96
34–34.9	.98	.93	.83	.91	1.00	.84	.79	1.19	.83	1.16	†1.16	.93	1.11	1.21	1.16	.98
35–35.9	1.00	.95	.85	.93	1.02	.86	.81	1.21	.85	1.18	.....	.95	1.13	1.23	1.18	*1.00
36–36.9	1.02	.97	.87	.95	1.04	.88	.83	1.23	.87	1.20	.....	.97	1.15	1.25	1.20	1.02
37–37.9	1.04	.99	.89	.97	1.06	.90	.85	1.25	.89	1.22	.....	.99	1.17	1.27	1.22	1.04
38–38.9	1.06	1.01	.91	.99	1.08	.92	.87	1.27	.91	1.24	.....	1.01	1.19	1.29	1.24	1.06
39–39.9	1.08	1.03	.93	1.01	1.10	.94	.89	1.29	.93	1.26	.....	1.03	1.21	1.31	1.26	1.08
40+	1.10	1.05	.95	1.03	1.12	.96	.91	1.31	.95	1.28	.....	1.05	1.23	1.33	1.28	1.10

* Minimum price and applies also to purchases of lower gravity.

† Maximum price and applies also to purchases of higher gravity.

[1] Tomball, Raccoon Bend (Deep) and Satsuma.

[2] Includes Amelia, Barbers Hill, Big Creek, Blue Ridge, Clear Lake, Cotton Lake, Esperson, Fannett, Goose Creek, Hankamer, Lovells Lake, Lochridge, Moore, Mykawa, Nome, Orange, South Liberty, Spindle Top, Sugar Land, Thompsons, Webster, and West Beaumont.

[3] Includes Berwick Bay, Bay St. Elaine, Caillou Island, Chacahoula, Dog Lake, Edgerly, Four Isle, Gillis, Grand Bay, Hackberry, Horseshoe Bayou, Iberia, Jefferson Island, Lake Barre, Lake Pelto, Leesville, Port Barre, Starks, Timballer Bay, Quarantine Bay, and Vinton fields.

[4] Anahuac, Dickinson, Gillock, Cedar Point, Fairbanks, Turtle Bay, Hull, Orange, Pierce Junction, Batson, Caplen, Humble, North Dayton, Saratoga, Sour Lake, South Esperson, Spindle Top, West Orange, Thompson (deep), and Raccoon Bend (shallow) fields.

[5] Includes Saxet, E. White Point, Greta, O'Connor McFadden, Taft, Plymouth and Tom O'Connor fields.

[6] Includes Duval, Jim Hogg, Webb and Zapata counties, Texas, and Heyser and Placedo fields.

[7] Oklahoma Pipe Line and Magnolia schedules.

[8] Includes La Barge, Midway Dome, Dutton.

[9] Also Buckner, Village, Magnolia.

[10] Add 10 cents for Bunkie and Eola field prices.

Mid-Continent Flat Prices

	Flat Price	Date Posted
Arkansas:		
Smackover	$0.73	10-12-38
Louisiana:		
Garden Island	1.24	10-12-38
Gibson	1.04	10-11-38
Lafitte	1.04	10-12-38
Texas:		
Cayuga	.78	10- 2-39
East Texas	1.10	10-12-38
Talco	.65	10- 2-39
Livingston, Cleveland	1.10	10-12-38
Van	.93	10-12-38
Pettus	1.29	10-12-38
Pecos County	.78	10-12-38
Pecos Shallow	.65	10-12-38
Luling	.87	10-12-38
Lytton Springs	.99	10-12-38
Salt Flat, Darst Creek, Hilbig, Carroll, Clark and Zoboroski	.96	10-11-38
Flour Bluff-Jim Wells Co.	1.23	10-11-38
Guerra	1.06½	5- 8-39
Seabreeze, Willow Slough, La Belle, Hardin, S. China	1.10	9-14-39
Clay Creek	.85	10-13-38
Conroe	1.27	10-11-38
Long Lake	1.08	10-19-38

Middle West Prices

Lima, Ohio	$0.90	10-13-38
Illinois, old fields	1.00	8-23-40
Illinois Basin	1.15	8-21-40
Lake Centralia-Salem, Illinois	1.15	8-21-40
Princeton, Indiana	1.00	8-23-40
Sw. Ind.-Se. Ill.: N. Griffin, S. Griffin, Phillipstown, New Harmony, Storms, Iron	1.15	8-21-40
Western Kentucky	1.05	8-21-40
Birk City, Western Kentucky	1.05	8-21-40
Kentucky River, Eastern Ky.	1.20	8-21-40
Big Sandy River, Eastern Ky.	1.12	8-21-40

Michigan Prices

	Flat Price	Date Posted
Central (Basin):		
Porter, Greendale, Crystal, Wise, Midland, Vernon	$1.12	8-24-40
Buckeye, Edenville, Bentley, Beaverton	1.10	8-24-40
Freeman, Sherman, Redding	1.07	8-24-40
Arenac, Ogemaw, W. Branch	.92	8-24-40
Southwest (Shallow):		
Allegan, Kent Counties	1.18	8-24-40
Van Buren Co., Bloomingdale	1.08	5- 1-40
Adams	.95	8-24-40
Clare	.81	8-24-40

Rocky Mountain States Prices

Colorado:		
Canon City, Ft. Collins, Wellington, Moffat and Florence	$0.90	10-11-38
Iles, Light	.98	10-11-38
Iles, Heavy	.92	10-11-38
Montana:		
Cat Creek	1.10	10-11-38
Cut Bank	1.00	1- 1-40
Sunburst	.80	1- 1-40
New Mexico:		
Artesia	.77	10-11-38
Hogback	1.00	10-11-38
Wyoming:		
Big Muddy	.98	10-11-38
Byron	.55	10-11-38
Dry Creek	.92	10-11-38
Elk Basin	.90	10-11-38
Frannie, Light	.55	10-11-38
Frannie, Heavy	.42	10-11-38
Garland	.50	10-11-38
Grass Creek, Light	.90	10-11-38
Grass Creek, Heavy	.40	10-11-38
Hamilton Dome	.35	10-11-38
Lance Creek	.77	10-11-38
Mill Creek	.72	10-11-38
Oregon Basin	.40	4-20-40
Osage	1.30	10-11-38
Poison Spider	.59	10-11-38
Rock Creek	1.00	10-11-38
Tensleep	.646	10-11-38

Eastern States Prices

	Flat Price	Date Posted
Bradford-Allegany	$1.85	8-28-40
Sw. Pa. Pipe Line	1.50	8-28-40
Eureka Pipe Line, W. Va.	1.44	8-28-40
Corning Grade, Ohio	1.12	11- 4-39
Buckeye Crude, Ohio	1.55	7-12-40

Major Price Changes

	Penna. Grade	Mid-Cont. (36 Gr.)	Calif. (26 Gr.)
June 19, 1933	Up 10	Up 19	.....
June 26, 1933	Up 10	.....	Up 9-12
July 6, 1933	Up 13	Up 10	.....
July 17, 1933	Up 15	.....	.....
July 28, 1933	Up 15	.....	.....
Aug. 11, 1933	Up 10	.....	.....
Aug. 24, 1933	.....	Up 10	.....
Aug. 30, 1933	Up 15	.....	.....
Sept. 6, 1933	Up 10	Up 10	Up 15
Sept. 8, 1933	.....	Up 15	.....
May 1, 1934	Up 10	.....	.....
Nov. 6, 1934	Cut 25	.....	.....
Dec. 6, 1934	Cut 25	.....	.....
Jan. 4, 1935	Up 15	.....	.....
Feb. 4, 1935	Up 15	.....	.....
May 16, 1935	Cut 15	.....	.....
June 26, 1935	Cut 15	.....	.....
July 16, 1935	Cut 10	.....	.....
Aug. 29, 1935	.....	.....	Cut *1
Sept. 6, 1935	Up 5	.....	.....
Oct. 29, 1935	Up 15	.....	.....
Nov. 1, 1935	.....	.....	Up *28
Nov. 18, 1935	Up 15	.....	.....
Dec. 6, 1935	.....	.....	Up *9
Jan. 9, 1936	.....	Up 10	.....
Jan. 13, 1936	Up 15	.....	.....
Mar. 7, 1936	.....	.....	Up *18
Dec. 28, 1936	Up 12	.....	.....
Jan. 28, 1937	.....	Up 12	.....
Feb. 24, 1937	Up 10	.....	.....
June 7, 1937	Up 15	.....	.....
Sept. 1, 1937	Cut 22	.....	.....
Oct. 12, 1937	Cut 25	.....	.....
Dec. 1, 1937	Cut 15	.....	.....
Mar. 7, 1938	Cut 17	.....	.....
June 13, 1938	Cut 25	.....	.....
Sept. 1, 1938	Cut 12	.....	.....
Oct. 11, 1938	.....	Cut 20	.....
Jan. 21, 1939	Up 12	.....	.....
Feb. 2, 1939	Up 8	.....	.....
Mar. 6, 1939	Up 12	.....	.....
Oct. 6, 1939	Up 25	.....	.....
Nov. 1, 1939	Up 15	.....	.....
Dec. 1, 1939	Up 10	.....	.....
Jan. 1, 1940	Up 25	.....	.....
Feb. 1, 1940	.....	.....	Cut *7
May 22, 1940	Cut 25	.....	.....
June 18, 1940	Cut 25	.....	.....
July 12, 1940	Cut 25	.....	.....
Aug. 28, 1940	Cut 15	.....	.....

* Signal Hill 26 gravity.

Crude Production Taxes

In all states other than Texas, levies are severance taxes, collected in lieu of all other taxes, with exception of small special assessments made in Louisiana and Oklahoma, as shown below.

In Texas, any political subdivision as well as the state has power to tax, and state itself levies special taxes in addition to gross production tax, as shown below.

Arkansas—2.6 percent of gross market value.

California—.66443 mills per barrel of oil produced and 17.39 cents an acre on proved lands.

Louisiana—From 4 to 11 cents a barrel, depending upon gravity, average being 7½ to 8 cents; in addition, special taxes may be levied on well equipment, bringing total tax to average around 8¾ cents a barrel.

Montana—Two percent of gross value at well and ⅝ of 1c per barrel.

New Mexico—Severance tax of 2 percent on oil and gas.

Oklahoma—Five percent of gross value less royalty interests; in addition, surplus warehouse stocks may be taxed by counties.

Texas—Gross production tax is 2¾ cents a barrel or 2¾ percent, whichever is higher, and averaged 2.94 cents in 1939. In that year, total tax on average barrel produced was, however, 9.23 cents, having included following levies: gross receipts 0.14 cents, regulatory 0.19 cents, state ad valorem 0.98 cents, other state taxes 0.62 cents, and local ad valorem 4.30 cents.

Wyoming—Production tax based upon state and county assessments.

NEW, LARGEST, SUBMERSIBLE
DRILLING BARGES

(Licensed by Texaco Development Corporation)

Built for Loffland Brothers Company and the Superior Oil Company

DESIGNED for stability with 12,000 feet of 9⅝-inch casing suspended in hold and 14,000 feet of 4½-inch drill pipe standing in derrick, these two submersible drilling barges—the largest ever built—feature a period of increased activity in drilling barge construction.

Each barge is 72 feet by 145 feet, consisting of twin hulls, 145 feet by 32 feet, with an eight foot slot. Connecting trusses are removable so that each hull may be towed separately if canal navigation becomes necessary.

Construction and equipment details, including mud system, drilling equipment, drawworks and auxiliary power barges, are extremely interesting. Today, the submersible drilling barge has fully demonstrated its ability to speed up marine drilling operations with substantial savings in costs per well. For further information, write:—

TEXACO DEVELOPMENT CORPORATION

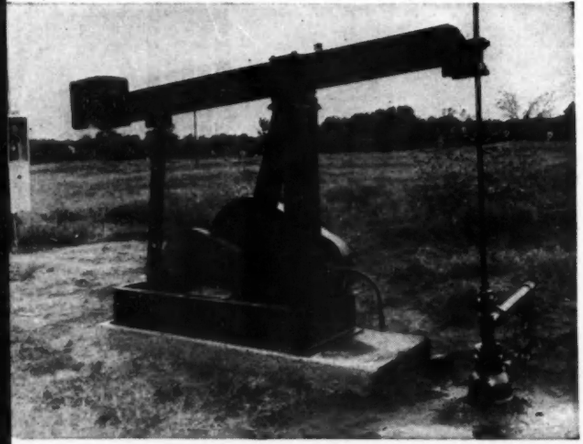
A Subsidiary of The Texas Corporation

26 Journal Square • Jersey City, N. J.

STOP THAT "CHARGE..."

PROFIT! BY USING Utility ELECTRIC POWER

USE Utility Electric Power!



★"Stop that Charge" means just as much in the oil field as it does on the football field. More so, in fact, for men in the oil industry must wage incessant warfare against the ever-mounting costs of oil production. Small wonder, then, that oil men in ever-increasing numbers are putting Utility Electric Power in operation wherever and whenever costly power charges appear.

These men have learned to their great satisfaction that Utility Electric Power rapidly and efficiently stops unnecessary charges such as: Fixed charges, downtime, etc. These men know their cost sheet will prove conclusively that Utility Electric Power keeps operating expense at a minimum. Low in first cost, economical in maintenance, and greater salvage value. Your nearest electric power service company will gladly give you facts and figures concerning your power needs. Call or write them today!

PETROLEUM ELECTRIC POWER ASSOCIATION

U. S. FIELD OPERATIONS

Illinois

Gallatin Test Has Saturation; Trenton Good at Sandoval

Recovery of saturation at a Gallatin County wildcat and a Trenton test showing for a producer in the old Sandoval field of Marion County highlighted the week.

The Gallatin test, Carter Oil Company's R. M. York 1, SE SE SW 33-7s-8e, found 10 feet of saturation at 1331-41 feet in a sand horizon, tentatively identified as the Biehl, and had run casing for a test. Pipe was not cemented. The wildcat is 12 miles northwest of Shawneetown and about the same distance from the Junction field. If successfully completed, it would give the county its third field. York 1 is only ¼ mile west of Kingwood Oil Company's Robin 1, an unsuccessful test drilled last winter.

At Sandoval, B. E. Martin's Robinson 1, SE SW 4-2n-1e, was waiting on cement at 4311 feet after between 23 and 27 feet of saturation was revealed in an electric log. Top of the Trenton, not now productive in the pool, was 4270 feet. The Sandoval field was productive in the Benoist and Devonian and has been nearly dormant since a recent Devonian drilling boom. Robinson 1 is on the extreme east side of the pool.

North of Sandoval in the Fairman pool, Shell Oil Company's Ververs 6-C, first deep test in that area, was drilling in Trenton lime at 4040 feet. The formation was topped at 3927 feet and a drill-stem test at 3927-50 feet showed little possibility of commercial production. Several cores were taken below 3950 feet before drilling was resumed. Production in the field is limited to the Benoist and Aux Vases. The Devonian was dry at Ververs 6-C.

A new pay horizon was being added to the Calvin field of eastern White County with near completion of Cherry & Kidd's Glave 5-A, SW SE SE 8-4s-14w, which found saturation in the Aux Vases at 2820-39 feet. The pool's present production is limited to the Benoist and Tar Springs.

The recently completed Tuesday Oil Company's George Works 2 in the Albion field of Edwards County, SW NE SE 13-2s-10e, made 3102 barrels of oil in its first full 24-hour gauge from the upper and lower McClosky, greatest production ever accorded a well in the area. Bottomed 50 feet deeper than any well in the field, the test has been acidized only in the upper McClosky. Other production at Albion is from the Bridgeport, Waltersburg and upper McClosky.

South outpost of the new Thompsonville field in Franklin County, where only one well has been completed, Wilhelmi & Gillen's Searles 1, NW NE 34-7s-4e, was reported to be showing for only a light producer after two acid treatments of 100 and 1000 gallons in McClosky at 3165 feet. Second completion in the field apparently will be Helmerich & Payne's Joann Sanders 1, NW NW NW 35-7s-4e, which was flowing 25 barrels an hour. Total depth, in McClosky, is 3113 feet. There were seven other operations and locations in the area.

In Washington County, Harry Hubbard's Hunleth 2, NE SE SW 19-3s-4w, near Hunleth 1, which was abandoned although a show of Benoist oil was found, was reported shut down at about Benoist depth. The test has been drilled tight, although it was reported a show of oil in the Benoist had been found.

A mile north of the Calvin field, White County, Al Walker et al's Hon 1, SE NE NE 5-4s-14w, was flowing natural from McClosky at 2863-71 feet. Production was estimated at 300 barrels daily. The well is regarded as a field extension.

Northeast of this test, on the banks of the Wabash River, W. C. McBride, Inc.'s Hon 1, SW SE SW 33-3s-14w, was waiting on cement after a squeeze job. When plug was drilled to the McClosky, the well showed only a small percentage of oil.

A Clinton County wildcat, shut down in Devonian lime at 2780 feet, may be drilled on to the Trenton. It is Hughes Petroleum Company's Schlafly 1, SE NE SE 3-2n-3w, which found no showings in formations encountered to date. Another wildcat in the county, B. E. Martin's Heinzmann 2, NW 9-2n-1w, was reported shut down at Devonian depth by the operators.

First oil well in Effingham County has been completed, but is regarded as an extension of the Loudon pool of Fayette County. Rufus H. Troop's LeCrone 1, NE SW 7-8n-4e, pumped 27 barrels of oil daily from Stein sand at 1540-54 feet. Sohio Corporation has extended its Loudon pipe line to service the well.

One of the state's most active new areas was the Woburn field, only productive area in Bond County, where there are 19 wells on pump. Total daily yield of the field at present is about 1000 barrels. Production is from Benoist at about 1020 feet.

Kentucky

Hopkins County Wildcat Resumes After Long Shutdown

A Hopkins County wildcat, Jess Ashby's John Paige 1, Section 3-I-25, ¾ mile southeast of Morton's Gap, resumed drilling after being shut down for several months at 1920 feet.

W. E. Hupp et al's King-Pruitt 2, Section 17-P-26, ¾ mile south of Hebbardsville, was showing for a good Jett-sand well as plug was being drilled in. Drilling in or near the Jett were two other tests in the field, Johnny Shoemake et al's Cooksey Bennett 2 and O. J. Cornell's Busby 2.

In Henderson County, three miles south of Corydon Unit production, Sun Oil Company's J. Snead Clark 1, SW SW 4-O-22, was abandoned at 2695 feet after testing slight McClosky show at 2666-70 feet.

In the Glenville pool of Daviess County, The Ohio Oil Company's S. J. Coomes 4, Section 12-N-28, two miles northwest of Glenville, was a Jett-sand completion at 1257 feet, initialing 100 barrels a day on pump after 65-quart shot.

Indiana

Posey County Wildcat Has Shows in Cypress and Benoist

Joe Engberg's L. P. Hill 1, NE NE NE 2-4s-14w, western Posey County wildcat two miles east of production, set drillable casing to test shows in the Cypress at 2704-20 feet and Benoist at 2864-74 feet. Total depth, through a dry McClosky that tested sulphur water, was 3127 feet. W. C. McBride's Ed Swander lease to the east has production from Cypress and Aux Vases.

Another Posey County wildcat, Basin Drilling Company's Oakland City College 1, SE SE NW 16-8s-14w, Sun Oil Company farmout, was drilling plug to test an estimated 16 feet of Aux Vases saturation. Only seven feet of core was recovered and no electric survey was made. The test is two miles north of dry holes drilled by Sun Oil Company. About five miles north and west, in northern Point Township, three tests to the Aux Vases and McClosky have been abandoned in recent months.

Disappointing was W. C. McBride's Lewis Heirs 1, NE NE NE 26-2n-11w, south of Vincennes, Knox, direct southwest offset to same company's C. C. Winkler 1, McClosky producer, which stirred heavy royalty buying in that area. The new test, drilled to 2009 feet, had only one foot of McClosky pay, and was shut down waiting on orders. C. C. Winkler 1 had McCloksy at 1872-1878 feet.

In western Posey County, Tide Water Associated Oil Company's Blanche Doll 1, SW SW SE 33-3s-14w, was waiting on cement with casing set to test Aux Vases saturation at 2791-99 feet, with drillable casing opposite Cypress show at 2143 to 2162 feet.

In Marrs Township, Posey County, Gulf Refining Company's Egli 1, SE SE SE 18-6s-12w, a mile northeast of Paul Rossi's Egli 2, Cypress producer, was shut down for orders at 2398 feet, through Cypress sand that tested water.

In Daviess County, Midwest Development Company's Dille 1, NW NE NE 2-2n-5w, three miles southwest of Loogootee, projected Devonian wildcat, was drilling at 800 feet.

A Spencer County wildcat, three miles north of Richland, Floyd Fau-

cett's Letcher Graham 1, SE NW NE 15-6s-7w, was reported drilling at about 1630 feet, expecting the McClosky at about 1700 feet.

In the Rockport gas field of Spencer County, J. C. Ellis, Owensboro, was drilling J. Fred Fisher 1, C SE NE 29-7s-6w.

A Vigo County wildcat, northwest of Terre Haute, H. N. Oakley's H. Mowrey 1, NW NE SW 29-13n-9w, was reported drilling at about 900 feet with cable tools.

In Columbia Township, Posey County, George Miller's Oakland City College 1, wildcat, was drilling at about 980 feet with cable tools.

New Mexico

Western Lea County Test Provides ¼-Mile Extension

The half-way reef-type of structure in western Lea County scored the largest producer in New Mexico in recent weeks when North Shore Oil Company's State-Texaco 1-A, SW NW NE 16-20s-32e, flowed 420 barrels of 36-gravity oil natural in 3 hours from Permian lime at 2495-2505 feet. It provides a ¼-mile north extension, and is the first of the six producers to encounter any appreciable volume of gas above and in the oil pay. Top of Brown lime was called at 2290 feet and Yates sand at 2387 feet.

Entura Oil Company's Lowe 1, northeastern Lea County wildcat, was abandoned at 6300 feet, having deepened 300 feet below original contract depth. Unsuccessful effort was made to finance the deepening of the test to the equivalent of the prospective 6600-foot oil zone found recently in the Wasson field, situated to the southeast in Texas.

George Abell and Neil Wills' Hale 1, SW SE SW 12-20s-30e, Eddy County wildcat, was awaiting orders at 1680 feet. Estimated flow of 6,000,000 feet of sweet gas was encountered at 1563 feet in lime topped at 1507 feet, and casing string cemented at 1563 feet failed to exclude all of the gas. Clark & Laneve's Boulter 1, NE SE NW 28-19s-27e, Lake McMillan district wildcat, lost tools while drilling plugs from casing. Oil sand at 885-90 feet previously tested a bailer of oil per hour.

Carter and Phillips Swap Properties in Four States

Consumation of a trade between The Carter Oil Company, Tulsa, and Phillips Petroleum Company, Bartlesville, involving producing properties in the Burbank, Ramsey and Bethel pools of Oklahoma; the Burrton, South Lorraine and Kraft pools of western Kansas; the Magnolia pool in Arkansas, and the Rodessa pool of Louisiana, was announced last week by the managements of the two companies.

Purpose of the trade is to consolidate production in areas to better serve the manufacturing facilities of each company, or its affiliates. It involves approximately 3200 producing acres, 274 wells and approximately 5000 barrels per day of production.

The transfer is effective as of October 1, 1940.

Kansas

New Lime Pool Indicated for Russell County at 2325 Feet

Jones & Shelburne, Inc., Oklahoma City, has opened a new lime pool 2 miles north of Greenvale pool, Russell County, at Lewis 1, SWc NE 28-14-12w, which stood with a hole full of oil from 2325 feet in a lime zone directly above the Topeka. Pay is classified as a local lime. The wildcat is 3 miles southeast of a Kansas City-lime producer. Eight-inch casing has been cemented. Log discloses Anhydrite topped at 591 feet, Fort Riley 1537 feet, Florence 1655 feet, Wreford 1721 feet, Cottonwood 1840 feet, and Neva lime, 1855 feet.

Stanolind Oil & Gas Company is testing small shows of oil in Topeka lime at Judd 1, C SE SE 15-21-38w, a Kearny County wildcat, and most western test in Kansas. With a plug set at 3860 feet, lime was treated with 1000 gallons of acid. Hole was swabbed recovering 30 barrels of water and ½ barrel of oil per hour, water later increasing to 45 barrels per hour. Crude decreased to 10 gallons per hour, testing 21.6-gravity and black. Operators plugged back to 3737 feet to retest a show of live oil at 3730-34 feet.

Selby Oil & Gas Company may open a new Stafford County area at Blackburn 1, CEL SE NE 13-24-12w, ½ mile east of Stafford townsite. Viola lime was topped at 3863 feet and casing run to 3882 feet, total depth. Good saturation was logged in a core, and casing will be perforated to test.

Derby Oil Company and Crow Drilling Company et al's Hancock 1, CSE SE 10-32-12w, wildcat between Whelan and Medicine Lodge pools, Barber County, topped Arbuckle lime at 4775 feet and penetrated to 4840 feet without a show. Electric log, run to determine testing stages in Mississippi lime, topped at 4307 feet, logged good showings at 4313-20 and 4338-52 feet. Should Mississippi lime fail to prove commercial, Viola lime, topped at 4582 feet, will be perforated at 4583-85 feet. Barbara Oil & Gas Company encountered promising cuttings in Mississippi lime at Angell "A" 1, C NE SE 10-33-14w, and may open a new gas area 5 miles west of Medicine Lodge gas and oil pool. Lime was topped at 4689 feet with a gas show at 4766-91 feet. Operators cemented 7-inch casing at 4764 feet and changed to standard tools prior to drilling plugs.

Two Barton County pools may be extended. Vernon Oil & Gas Company's Ney 1, CW½ NE 17-16-11w, ½ mile east of Prusa pool, was testing a show of oil in Lansing-Kansas City lime at 3115 feet. The Texas Company's Burmeister 1, SWc 2-17-11w, ¼ mile north of Kraft pool, found saturation in Arbuckle lime at 3303-06 feet and ran casing to test.

In the Udall area of Cowley County, Sage, Murfin & Markey et al's Carlson 1-A, CWL SW SW 21-30-3e, a semi-wildcat, filled with water in Mississippi lime at 3015-17 feet but cemented 5-inch pipe at 3020 feet. Two small oil shows in Kansas City lime were noted at 2910-25 feet and 2980-90 feet. Hole may be deepened to Arbuckle lime before testing upper shows.

Oklahoma

Wild Well Revives Play on Southeast Flank of Lovell

Danciger Oil & Refineries, Inc., revived play on the southeast end of Lovell pool, Logan County, as Richards 1, CNE NW 3-17n-4w, ½-mile from production, flowed wild after gas pressure blew the swab through the derrick. After crew succeeded in shutting in, operators estimated production to exceed 500 barrels daily. Layton sand was logged at 4850-90 feet, and was perforated through casing with 80 shots at 4870-90 feet. Earlier, the semi-wildcat failed to perform when the hole was loaded with mud and geologist expressed the opinion that a gas cap in the upper section of the Layton was cased off. Tankage has been erected.

Kennith Ellison and Big Chief Drilling Company started cellar and pits at Strange 1, CSW SE 27-18n-4w, on the east flank of the structure, with location on a 240-acre lease block. Elmer Wood et al, announced immediate work in SEc 21-18n-4w, on a spread of 400 acres. Layton zone will be the objective of these two tests, although Viola and Hunton possibilities are believed good around the flank.

Second Wilcox sand production was extended ¼ mile north at Hilton Phillips et al's Cherry 2, SE NE SW 21-7n-4e, St. Louis pool, Pottawatomie County. Old bottom was 4154 feet, and hole was deepened to top pay at 4286 feet with hole bottomed at 4290 feet. On potential, it pumped 1300 barrels of oil in 24 hours. A larger extension of this horizon was recorded northwest as Sinclair-Prairie Oil Company's Reagan 1, SEC NE 17-7n-4e, pumped 272 barrels of oil and 390 barrels of water in 24 hours. Second Wilcox sand was logged at 4179-85 feet, with old depth at 3955 feet.

In East Cromwell pool, Okfuskee County, two large producers were completed. Shell Oil Company's Replogle 2, SEc 35-11n-8e, flowed 1074 barrels in 24 hours from Cromwell sand drilled to 3517 feet. Reese Drilling Company's Berryman 2, SW NW SW 36-11n-8e, flowed 565 barrels in 24 hours from pay at 3483-3513 feet. The Texas Company failed to find commercial production in Cromwell sand at Berryman 1, NW SE SW 36-11n-8e, and was coring below 4015 feet, seeking Hunton lime. Shell Oil Company was drilling at Replogle 3, SE NE NE 35-11n-8e, and Replogle 4, NEc SE 35-11n-8e.

Wilcox Oil & Gas Company completed a small spot opener between Davenport and Sac & Fox pools, Lincoln County, at Murphy 1, NE SE SW 7-14n-6e, pumping 8 barrels of oil and

THE ECONOMY TRUCKS

FORD

Big jobs are in the making for 1941. They're jobs that have got to be done fast, efficiently, economically. Here are the 1941 Ford Trucks that are built to meet these present-day dimensions for dollar-saving dependability.

They "have everything." Choice of power. Range of wheelbases. Wide range of body and chassis types. And the kind of economy that really counts — *over-all* economy.

The 95-hp Ford V-8 engine has an extra margin of horsepower not offered in any other low-price truck, and sells at several hundred dollars less than any other truck with equal horsepower rating. The 95-hp engine is teamed up with the famous Ford 85-hp engine that has proved its dependability and economy in billions of miles of payload performance.

There's new styling and there are many new improvements and refinements. Above all, there is the down-to-earth quality and economy that have made Ford V-8 a symbol of dollar-saving performance in nearly every kind of hauling and delivery work.

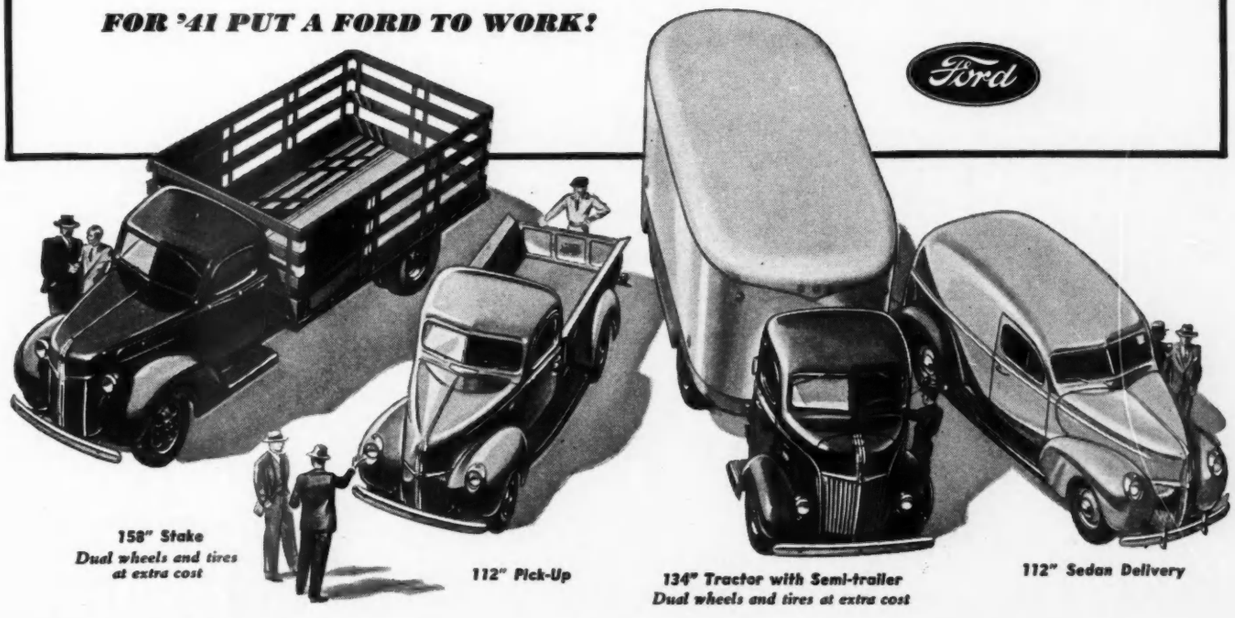
See the Ford V-8 Truck at your Ford dealer's. Put one to work on your job and test it your own way. Prove to yourself that this is the unit to do your job, in less time, at lower cost.

1941 FORD FEATURES

Two V-8 engines — 95 and 85 hp ★ New 4-cylinder 30-hp engine for maximum economy in Commercial Cars, ¾ and One-Ton Trucks ★ Six wheelbases — 42 body and chassis types ★ Full-floating rear axles in all trucks — ring gear thrust plate ★ ¾-floating axle in Commercial Cars ★ Straddle-mounted driving pinion ★ Big hydraulic brakes ★ Two-speed axle as well as reinforced frame in trucks for heavy-duty service are optional at extra cost.

Ford Motor Company, builders of Ford V-8 and Mercury Cars, Ford Trucks, Commercial Cars, Station Wagons and Transit Buses

FOR '41 PUT A FORD TO WORK!



158" Stake
Dual wheels and tires at extra cost

112" Pick-Up

134" Tractor with Semi-trailer
Dual wheels and tires at extra cost

112" Sedan Delivery

16 barrels of water in 24 hours. Prue sand was shot with 200 quarts at 3200-3268 feet.

J. E. Crosbie perforated Hunton lime at Murphy 1, NEc SW 20-19n-2e, offset to the West Stillwater discovery in Payne County, after cores failed to reveal sufficient shows in Wilcox sand at 4696-4712 feet.

Wildcat Failures

Kadane Brothers moved out rotary equipment at Andrews 1, NWc 35-2s-19w, Tillman County test, after plugging back to 5500 feet in the Pennsylvanian. Hole was originally carried to 5632 feet, but failed to recover commercial shows.

Cline et al's Staley 1, SEc NW 10-2s-19w, 5 miles north of Frederick pool, was plugged at 6710 feet in green shale. Canyon lime was topped at 3568 feet, Sylvan shale at 6494 feet, and Viola lime at 6510 feet.

W. L. Graham et al's McClain 1, SE SW SW 7-12n-7e, 1½ miles northwest of Paden pool, Okfuskee County, was plugged in Prue sand at 2960 feet.

Grimes & Vaughn et al's Baker 1-A, SE NW NW 35-2s-6w, 1½ miles south of Woolsey pool, Stephens County, recovered an oil show in sand at 1101-24 feet but abandoned at 1418 feet. R. M. Scott's Reelburgh 1, SW SE NE 14-1n-9w, northwest of North Duncan pool, was a failure at 1710 feet.

Osage Strike

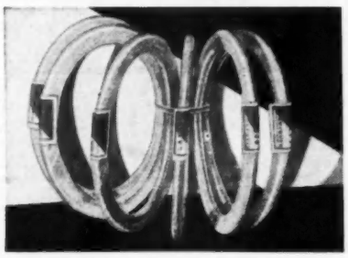
Peters Petroleum Company and Norbla Drilling Company acidized their Arbuckle-lime discovery in East Hominy pool with 2000 gallons and the well flowed steadily. Osage 15, SE NW SW 16-22n-9e, flowed 127 barrels the first 24 hours and was averaging 125 barrels of 36.5-gravity oil daily. Pay topped at 2636 feet, was drilled to 2655 feet, opening initial Siliceous-lime production for this area.

Indian Territory Illuminating Oil Company's Miller 1, SW NW SW 35-12n-8e, extension to Dill pool production in Okfuskee County, was completed for 939 barrels on a 14-hour test. Cromwell sand was topped at 3519 feet and penetrated to 3556 feet. Shell Oil Company staked location for Curry 1, SWc NW 35-12n-8e, ¼ mile north of the above extension.

North American Oil Company spudded two tests in Pontotoc County. Mount 1-A, SE SW NW 13-4n-6e, Oakman townsite, was below 350 feet, and Mayer 1, NE NW NE 20-4n-7e, in the East Ada district, set surface pipe.

Oklahoma Oil Corporation staked Berry 1, SEc NW 28-16n-5e, northwest of Kendrick pool in Lincoln County.

KEEPING 'EM ROLLING By WESTCOTT



J-M KEARSARGE BOILER GASKETS: Form lasting tight seals on handholes, manholes and tube plates.

P.S. THEY DID!...with tougher, tighter-sealing J-M Kearsarge Boiler Gaskets

FREQUENT tie-ups for packing or gasket replacements cost plenty in wasted time and idle equipment. Yet much of this expense can be saved by materials built to stand up longer. The next time you have a replacement job, try J-M Packings and Gaskets and you'll find out what real packing economy means. For details on the complete J-M line, write for the J-M Packing Catalog. Johns-Manville, 22 E. 40th St., N. Y., N. Y.

JM PRODUCTS

JOHNS-MANVILLE PACKINGS & GASKETS

THERE'S A DISTRIBUTOR NEAR YOU

Forest City Basin

Falls City Has 11 Wells; Oskaloosa Pool Defined

Two new producers were being added in the Falls City pool, making 11 oilers for the area. Skelly Oil Company's Davisson 2, NE NW NE 20-1n-16e, topped Hunton lime at 2256 feet and cemented 7-inch casing at 2258 feet prior to drilling plugs in pay. Pawnee Royalty Company's Sandrock 1, NW SE NW 20-1n-16e, topped Hunton lime at 2214 feet and was coring saturated lime. Average daily production in the Falls City pool is between 450 and 500 barrels, although total output is estimated at 2500 barrels. Skelly Oil Company is selling crude to Union Pipe Line Company.

Nemaha Development Company was reported staking location in NWc NE 32-5n-15e, Nemaha County. Northeast of this proposed test, J. O. Issacs et al's Magor 1, CNE NE 15-5n-15e, 8 miles east of Auburn, topped Hunton lime at 2666 feet and cored at 2673-2701 feet to recover dry lime with no shows. Operators were rotating below 3000 feet to test the Viola. Nine miles southeast of Auburn, Black Gold Operating Company moved in rotary tools at Allen 1, C SE SW 16-4n-15e, Nemaha County.

Skelly Oil Company was drilling below 750 feet at Wallraff 2, CSW SE 20-1n-16e, in the Falls City pool. Jackson and Rust staked location for Concklin 1, CNE NE 30-1n-16e, a mile southwest of production.

Kansas Sector

W. O. Stark defined Oskaloosa pool, Jefferson and Leavenworth counties, at Ragan 1, CN½ NW NE 4-10s-20e, which was abandoned in dry Dolomite at 1665 feet. Same operator staked Dark 3, C NW NW 4-10s-22e, in the pool.

North of Ray pool in Phillips County, C. N. Trickett et al were moving in materials for Gossic 1, NWc 33-2n-21w, in Furnas County, Nebraska, just across the Kansas boundary line. In Dakota

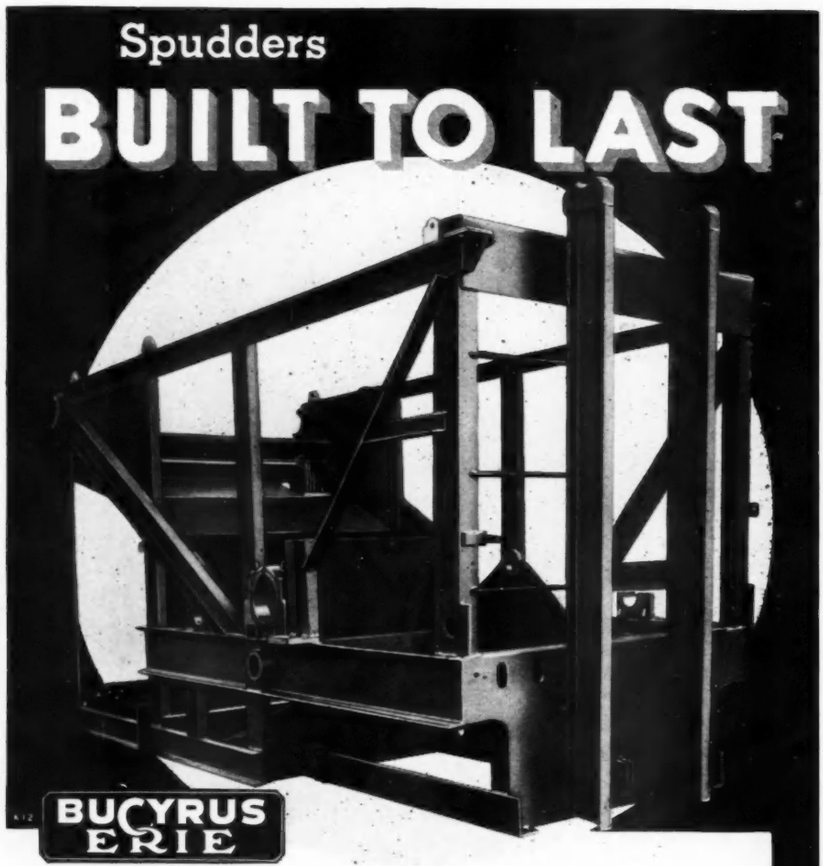
Symbols of
PRODUCTION EFFICIENCY
These dependable Parkersburg pumpers, photographed at random, represent but a few of the more than 50 different types of units in the Parkersburg line. They also represent but a few of the almost endless list of satisfied operators, from almost every producing state in the country, whose wells are equipped with these quality-built pumping units. Today, wherever Parkersburg units operate, they are recognized as symbols of dependable, economical, efficient production. Moreover, their superior performance is not a matter of chance, or accident . . . for we build into them the kind of quality that insures extraordinary service under ordinary operating conditions.
THE PARKERSBURG RIG & REEL COMPANY, Parkersburg, W. Va.
DALLAS
HOUSTON
TULSA
THE PARKERSBURG RIG AND REEL CO.
LOS ANGELES
NEW YORK
D-3-40

County, Nebraska, Peder Skriver et al's Armour 1, NEc 33-28n-8e, topped Arbuckle lime at 1200 feet and was underreaming 5-inch casing at 1300 feet.

Sonken-Galamba et al's Lehr 1, CSE SE 25-5n-14e, 2½ miles southeast of Auburn, Nebraska, was junked when 10-inch pipe collapsed and the hole was lost at 1357 feet.

Missouri

Chillicothe Syndicate's Linton 1, NE SW SE 15-56n-23w, 8 miles southeast of Chillicothe, was plugged in dry Arbuckle lime logged at 1140-1213 feet. T. E. Baldwin et al's Johnson 2, SW NE NE 21-65n-15w, topped Hunton lime at 983 feet and suspended operations at 1200 feet. No shows were logged.



This strong, rigid, trussed box-frame is found only on Bucyrus-Erie "Spudders of Tomorrow." All-steel, all-electric welded, the frame holds the machinery securely in enduring alignment.

And, because Bucyrus-Erie engineers need allow for no wabbling or play-at-the-joints they build in accurately machine-cut gears that mesh perfectly, reduce friction and deliver more engine power to the drilling line.

You get faster hole, less maintenance, and quicker moves with a Bucyrus-Erie Spudder on your job. There is a size to fit. A bulletin will show you how you can make more money with these modern drills. Send for it today.

Bucyrus-Erie
SOUTH MILWAUKEE, WISCONSIN

West Texas

Fourth Well for Shallow Soma; Wasson Field Test Deepening

Western Crockett County's Soma shallow pool recorded its fourth prolific oil producer when Mudge Oil Company's Noelke 1-B, SWc S½ of N½ NE HE&WT Section 30, flowed 208 barrels of 33-gravity oil on one-hour test through two 3-inch lines on casing. Production is from Soma sand in the Yates section at 1243-44 feet. It is a north offset to the company's Noelke 1, which registered heavy flow of oil with excessive gas volume when given brief gauge July 6 after drilling pay at 1134-44 feet, with an elevation of 2445 feet. Official potential gauge on the latter has not been taken. The area has 5 oil producers, including a small flowing well, and two gassers. It is 4½ miles east of the south end of the Yates field, which is without a rival for big wells at shallow depth.

Silas Pittman and George Atkins' Noelke 1, north offset to the latest completion, was drilling at 715 feet. Owners of the oil wells are negotiating for a pipe-line connection, as production to date has been confined to tank truck movement. J. K. Hughes Oil Company's Shannon 1, 2½ miles north of the Soma oil pool, was drilling at 2590 feet in Permian lime, topped at 2417 feet, or 446 feet above sea level. It was scheduled to be abandoned at 2502 feet. No water has been logged in the Yates or the lime.

The deep oil horizon uncovered in the Gaines County portion of the Wasson field by Amon G. Carter's A. L. Wasson 4-D, NWc SE PSL Section 50, Block AX, has been passed up for the present to explore the lower levels. The test was drilling hard lime at 6750 feet. Production test at 6610 feet with tubing packer at 6274 feet yielded 2 to 3 barrels of green oil hourly on swab after using 6500 gallons of acid. No pressure was applied in making the 3-stage acid treatment as the well had open hole below 7-inch casing seat at 5189 feet. The tubing packer also excluded sulphur water found immediately below the regular 5100-foot oil horizon for the field. No goal has been set in carrying the well deeper, although it is due to be carried below the Permian series. If no additional pay zones are found, the test will be plugged back and run pipe to try for completion in the 6600-foot horizon. The finding of the new oil horizon for the north end of the basin will undoubtedly result in some of the future wildcat projects being contracted to equivalent levels.

Forest Development Corporation's Whisenant-Shell 1, Yoakum County semi-wildcat and 1⅓ miles northwest of the Waples-Platter pool, logged top of anhydrite at 2560 feet, being about level with nearest production, and was drilling at 2570 feet. Geo. Livermore et al have taken over the operation of Sloan & Zook Company et al's Waples-Platter 1, second producer for the area, and will condition the well for final potential gauge. It flowed by heads after building up pressure with the hole bottomed at 5297 feet.

No details have been released on Phillips Petroleum Company's Cowden-Embar 1, southwestern Andrews County wildcat, after 475-quart nitro shot at 4240-4335 feet. A small producer is anticipated as the well responded to acid treatment with a gas flow on completion try at 4299 feet. Texas Pacific Coal & Oil Company and Seaboard Oil Company were conducting a seismograph survey of their recently tested wildcat block in southeastern Andrews County. The first test was abandoned after a favorable oil showing in the regular lime, and another is pending.

Taubert-McKee & Siemoneit's Crockett 1, northern Pecos County Ordovician test, was drilling at 4760 feet and apparently still in the Permian. It is 1¼ miles south of a deep test on the McKee tract that passed up nominal yield of oil and gas at about 500 feet in the Simpson, topped at 4775 feet, or 2390 feet subsea. Gulf Oil Corporation's Wristen 5, first Ordovician test for Ward County, was drilling by stem at 8874 feet, having plugged back from 9187 feet. The original hole entered Ellenburger at 9002 feet, with small amount of free oil showing on drill-stem test at 8967-9049 feet.

Sand Hills Extension

Northeast extension sector of the Sand Hills field contributed an outstanding well when Gulf Oil Corporation's Waddell 13, C NW PSL Section 29, Block B-26, earned potential rating of 2774 barrels of 35-gravity oil with 13,694,000 feet of gas from lower Permian at 4585 feet, or 1948 feet subsea. The gas volume is above the average for the area. Rig has been skidded ½ mile east to drill Waddell 14.

Gulf Oil Corporation's University 1-F, NW SE SE Section 22, Block 31, Crane County wildcat and 5 miles west of the north end of the Church & Fields area, was drilling at 6225 feet with the Ordovician as its objective. No shows have been encountered in the Permian.

Forest Development Corporation, most active prospecting unit in the district, has run pipe for a production test at Paul Moss 1-H, C SW NW T&P Section 48, Block 43, T-2-S, situated 1⅓ miles south of the South Cowden pool, and about the same distance southwest of nearest production in the Foster field. First saturation was logged at 4075-4102 feet, with intervals of saturation to bottom at 4300 feet. Top of brown lime was called at 3730 feet, and solid lime at 3895 feet, with an elevation of 2946 feet. Completion of a producer would automatically discount an intermediate dry hole that passed up oil saturation in drilling to 4702 feet in 1934. Forest Development Corporation's Bradley 1, SEc T&P Section 18, Block 43, T-3-S, only active wildcat in Ector County, was drilling at 4230 feet, having logged first solid lime at 3795 feet, or 754 feet subsea. The Foster-South Cowden pay was not present, but it will continue to the equivalent of the Harper field zone.

Noelke Field Hearing

Standard 10-acre spacing for wells in the Noelke field, Crockett County, was requested at a recent hearing before the Texas Railroad Commission. Soma Oil & Gas Syndicate, which had requested the hearing, asked that the commission allocate production on acreage and potential, with 50 percent on each factor.

A maximum tolerance of ten acres for all wells was requested, by operators, but some thought at least 75 percent of the allowable should be distributed on an acreage basis.

Production in the field is found at 1100 feet in the Soma sand, and the initial well is good for 20,000 barrels, according to Henry Schooler of Soma Oil and Gas Syndicate. Oil is sold to the Western Refinery at Fort Stockton, which has a demand for 200 barrels daily from the field.

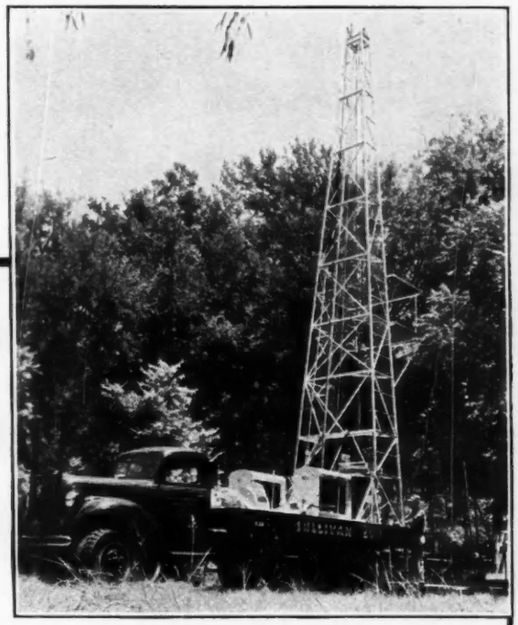
North Texas

Marble Falls Section of Bend Yields New Jack County Pool

Jack County added a new pool when Continental Oil Company's J. B. Robertson 1, SW¼ M. J. Swan Survey, A-1650, 8 miles southwest of Jacksboro, sprayed oil with unusually high pressure gas from the Marble Falls section of the Bend at 4662 feet. Preliminary test through casing yielded 5 barrels of high-gravity oil in 11 hours, with gas volume rated above 2,000,000 feet daily. Closed in pressure built up to 1750 pounds. Production is from porous conglomerate at 4651-60 feet followed by shale and sandy-lime. The well will be tested for several days, then deepened. Top of Palo Pinto was called at 896 feet, and first Bend lime at 4265 feet.

The Robertson prospect is supported by a 1950-acre lease block held by Continental Oil Company. Lease expiration in 1941 will require a number of tests, if the block is to be held intact. Nearest deep lime production is 3¾ miles south, and involves Shell Oil Company's Wil-

Test Drilling Outfit mounted on Marmon-Herrington 6-wheel *All-Wheel-Drive* converted Ford.



GOOD ROAD
—BAD ROAD
—NO ROAD AT ALL

. . . It's All the Same to a Marmon-Herrington *All-Wheel-Drive*

Well, maybe not just exactly the same, but the ability of these powerful units, *with traction on all four or all six wheels*, to perform in the worst possible "going," never ceases to amaze the most skeptical. If there's any "bottom" to the road at all, a Marmon-Herrington *All-Wheel-Drive* will get through. All standard Ford trucks, passenger cars and commercial cars converted to *All-Wheel-Drive*, also 33 extra heavy duty models, up to 70,000 lbs. capacity, built in our plant. Any standard or specialized equipment mounted. Write for literature. Cable address MARTON, Indianapolis, U.S.A.

MARMON-HERRINGTON COMPANY, INC.
INDIANAPOLIS, INDIANA, U.S.A.

liams 1, which has been producing since February, 1922, at 4614 feet. Rathke Oil Company and R. C. Parker's Mosely 1, projected Bend-horizon wildcat, was drilling at 4200 feet.

Fargo Deeper Lime

The proving of a deeper lime pay for the Fargo pool, Northwestern Wilbarger County, substantiates information gained from the discovery that the area has a minimum of four oil horizons. Two new operations are under way and a steady drilling program will materialize if a pipe-line connection is provided. Amerada Petroleum Corporation's Parker 1, SW SE H&TC Section 36, Block 15, a mile southeast of the discovery, is rated at 125 barrels of 41.5-gravity oil daily, flowing by heads. Production is from broken saturation at 4437-76 feet in Strawn, topped at 4385 feet, or 166 feet lower subsea than the original producer. The well was given 2-stage treatment with 6500 gallons of acid. The company's Goodpasture 1-A, south offset to the discovery, has cemented 7⅝-inch surface pipe at 70 feet, and authorized location for Foley 1, near CSW SW Section 36. Humble Oil & Refining Company has derrick up for Anderson-Bond 1, NEc Section 33. A 40-acre spacing program is to be followed.

Shell Oil Company's Coleman 1, Eastern Archer County wildcat that passed up probable oil production in the Strawn and Bend, cemented 4½-inch pipe at 5458 feet, or 10 feet off bottom, after encountering cavity that could not be filled with mud, cottonseed hulls and cement. Pipe is due to be perforated opposite oil saturation in upper Bend at 5009-53 feet, while the most promising oil showing was gained from Strawn at 3648-3700 feet. It is 2½ miles northeast of several Strawn producers in the Chalk Hill field. Walter Gant and Tom Medders' Robert Vogtsberger 1, southeast offset to their northeastern Archer County wildcat producer, cemented 7-inch pipe at 4644 feet to test broken pay in Strawn at 4651-84 feet. Top of pay is 5 feet higher subsea than the flowing producer, which was plugged back from Ellenburger.

Ringgold Pool Edge Test

Swabbing test given Gulf Oil Corporation's Worsham-Spring 2, northwest edge of the Ringgold pool, apparently exhausted a small showing of water that appeared when the well flowed 46-gravity oil by heads from broken conglomerate pay between 5662-5811 feet. A 24-hour swabbing test yielded 108 barrels of oil. British-American Oil Producing Company's Martin 2, north offset, has failed to eliminate water in plugging back third time from Ellenburger at 5965 to 5720 feet. Faulty casing seat is charged with being the source of the water. Gulf Oil Corporation was starting Worsham-Spring 3 as a south edge test. Walter Gant et al's Stine 1, 1½ miles west of production, was drilling at 5180 feet. Three rigs are running in the Hapgood pool, Clay County, which is possibly a west extension for the Ringgold deep area.

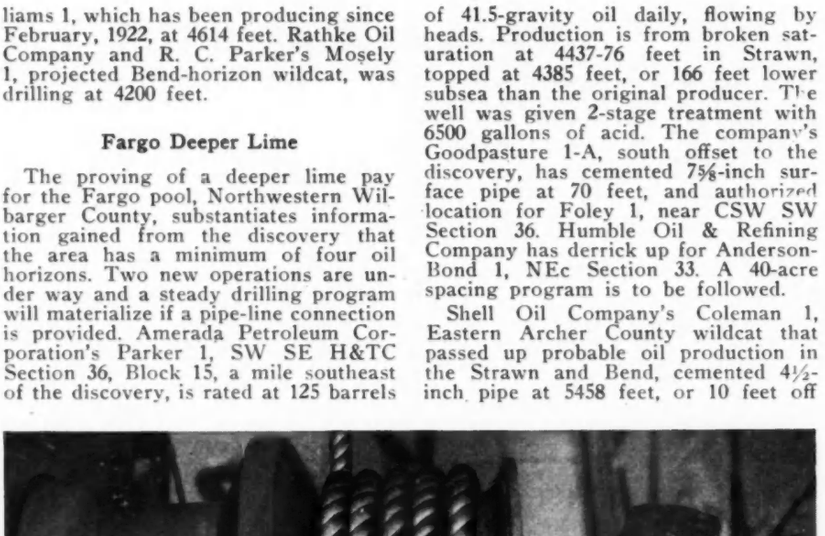
Seitz-Comegys & Seitz, Inc.'s Harris 1, projected 6000-foot test for the Hardy prospect, Eastern Montague County, logged top of broken sand at 5653 feet, and was drilling dry coarse sand at 5665 feet.

Two Clay County wildcats were abandoned after proving dry in the Ordovician. W. B. Omohundro et al's Wynn 1, NW Section 2, G. Gowan Survey, entered Simpson at 6546 feet and halted at 6654 feet. It was originally drilled to the 6070-foot level by Youngblood, Foree et al last year. Jones Associated Oil Company, Roberts & Lynch's Edwards 1, north of the Ringgold-Hapgood production trend and in the northeast part of the county, quit in Ellenburger at 6077-6234 feet. No conglomerate was logged in the Bend, topped at 5929 feet.

Wise County Wildcat in Trouble

String of casing has been lowered in Britt Cranfill and C. E. Rodgers' McKay 1, northwestern Wise County wildcat, to wash down and try and loosen section of drill pipe shot off at 5725 feet after developing fishing job at 6067 feet. Walter Gant et al's Will Laird 1, 2¾ miles north, is awaiting the outcome of this test before attempting to complete as a producer by perforating pipe opposite oil saturation passed up in the Strawn and Bend in drilling to 6651 feet. Hults and Owens' Tucker 1, recent Bend-lime strike for western Montague County, is scheduled to make official potential test of pay at 6016-50 feet this week. Magnolia Pipe Line Company connected to the 2000 barrels of lease storage with a 4-inch extension from its nearby trunk line.

Sinclair Prairie Oil Company's West



Longer life, under hard use in drilling operations, makes Plymouth Oil Well Cordage not only economical but most satisfactory from the standpoints of actual use and of maintenance costs.

The longer life of Plymouth Oil Well Cordage is not the result of chance or accident.

It is the result of selecting fiber specially adapted for oil well cordage, because of its strength and toughness to resist both internal and external abrasive wear, as well as the heat and flexing under heavy loads.

Plymouth Cables for instance are given an extra internal lubrication in order to further enhance their wearing and working qualities and prolong their life.

It is the result also of strict scientific control and careful inspection throughout every stage of the manufacturing process. Plymouth Ropemakers have developed specialized ropes for all needs of oil well drillers as listed below—as well as for incidental uses around the rig, such as swabbing, bailing, hoisting, pipe jointing and for "shooting" the completed well.

PLYMOUTH MANILA

DRILLING CABLES	TORPEDO LINES	CATHEAD LINES
BULL ROPES	CRACKERS	SPINNING LINES

PLYMOUTH CORDAGE COMPANY
NORTH PLYMOUTH, MASSACHUSETTS

DISTRIBUTORS: Oil Well Supply Co.—Over ninety stores in all fields with ample stocks of Plymouth Oil Well Cordage immediately available at all times.

PLYMOUTH
THE *Rope* YOU CAN TRUST

Bonita Unit 1, townsite test for the Bonita pool, passed up indicated flowing production in the Upper Bend conglomerate at 5256-68 feet, and has run pipe to test the lower pay at 5424 feet. The company's North Bonita Unit 1 (20.97 acres) cemented surface pipe. Magnolia Petroleum Company's Gilbert 3, north edge test, is due to acidize through casing perforations at 5473-81 feet after bailing ½-barrel oil per hour. It tested water in Ellenburger at 5977-6003 feet.

Sinclair Prairie Oil Company's Ramsey 2, east edge of the Walnut Bend field, Cooke County, filled 3000 feet with oil after drilling casing plugs, then swabbed 140 barrels oil in 12 hours. Production is from sand at 5006-15 feet, and is slightly lower than the producing level of nearby wells.

East Texas

Third Chapel Hill Oil Well Encourages Further Effort

Completion of a third oil producer on the north end of the Chapel Hill field, Smith County deep area, provides needed encouragement for a continuation of development. Six of the nine tests drilled since the discovery in July, 1938, are gas-distillate producers, and only one of the latter has a profitable market outlet.

Shell Oil Company's Kinsey 1, north offset to the first oil completion, flowed 15 barrels of 44-gravity pipe line oil hourly, natural, through 3/8-inch choke after perforating opposite Pettit saturation at 8055-82 feet. The hole was plugged back from Travis Peak at 8260-91 feet.

Sun Oil Company and Shell Oil Company's Mosley 1, situated 4000 feet southwest of the first oil well, produced a small volume of gas and distillate after acidizing through perforations between 8140-8227 feet in the Pettit, topped at 8051 feet. Travis Peak at 8255-79 feet was non-productive. Mosley 1 will be plugged back for production test in the Paluxy and if this zone proves barren completion will be made in the Pettit.

Amerada Petroleum Corporation's Lloyd 1, projected Trinity test for northern Wood County, was drilling at 4860 feet with about a 1200-foot section of Georgetown lime immediately ahead before reaching the next possible producing zone. No shows were recorded in the Woodbine, topped at 4483 feet with an elevation of 444 feet. Bobby Manziel et al's Morrison 1, Woodbine test for the Hawkins geophysical prospect, southeastern Wood County, was drilling at 3390 feet with an elevation of 423 feet.

Combination of soil analysis and subsurface geology is the basis for the locating of Tom G. Shaw, trustee's High & West 1, Van Zandt County wildcat. The projected Woodbine test will be near center of 100-acre tract, L. Smith Survey, four miles southwest of Canton. It is on acreage assigned by Harry Reynolds, Hickok and R. E. Lee. The latter drilled a Woodbine failure on the block last December.

The Frankston area, northeastern Anderson County, has been assigned a Woodbine test to be drilled by the R. H. & W. Oil Company on the A. C. Saunders 17-acre tract, Joe Ferguson survey.

Texas Permits

Drilling activity in Texas was on the decline last week as 125 permits were authorized by the Texas Railroad Commission, 110 less than the week before.

Permits for 6 wells in the East Texas field were approved, with 4 in Gregg, 1 in Rusk and 1 in Upshur County, while 2 locations were reported from the remainder of the East Central Texas area.

Southwest Texas led the state with 37 locations, and Gulf Coast operators ranked second with 22 tests. There were 20 permits reported from West Texas, including 12 in Pecos County, while 11 were approved in West Central Texas.

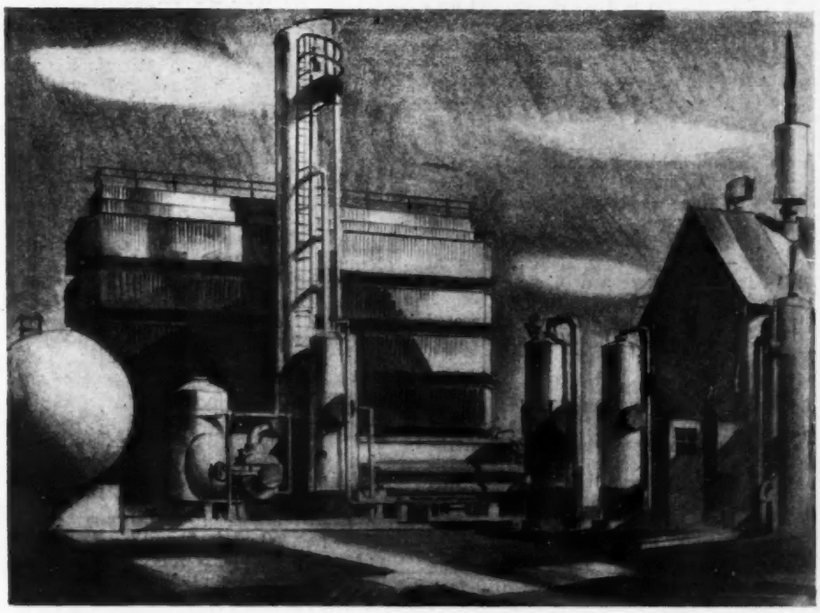
Permission to drill 21 wells in the North Texas district was granted, and 6 locations were listed from the Panhandle.

Texas Hearings

A hearing has been scheduled by the Texas Railroad Commission for October 11 to determine what special operating rules should be applied to the area surrounding the Guy A. Davis' Holbein 1, Lot 35, Section 4, Jim Hogg County.

Special operating rules for the Sullivan field, Nueces County, will be considered at another hearing the same day.

The monthly state-wide gas hearing has been scheduled for October 15.



RECYCLING PLANT from a lithograph by E. M. Schlwetz

DISCUSS your banking needs with an officer of the First National. Our location in the oil capital of North America has given us a practical knowledge of the oil man's banking requirements, and a wide experience in meeting them. Corporations and individuals in every department of the industry have found First National service helpful; so will you!

FIRST NATIONAL BANK
IN HOUSTON
MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

Southwest Texas

Wildcat West of Ganado Promising Oil Production

Pure Oil Company was making preparations for a production test in a wildcat 4000 feet southwest of the Ganado townsite in Jackson County. The well, drilled as a closed operation, is reported to be a potential producer at several levels, in the Frio and possibly extending into the Vicksburg formation. The test, Spacek 1, is in the northeastern portion of the Menefee Survey. It was carried to 6600 feet and casing landed at 5554 feet. Perforations will be made for testing sands at 5201-09 feet, 5010-43 feet and 4931-33 feet.

Fred W. Shield and R. P. Rutherford's Mitchell 1, in the northeast corner of the Lolita townsite and ½ mile west of the field bearing that name, has been finished as an average well for the field. Perforations had been made at 5932-36 feet after plugging back from 6575 feet.

Henshaw Brothers apparently are opening a new oil field in the eastern portion of Jim Wells County, 3 miles southeast of Orange Grove townsite. Grossman 1 was drilled to 5785 feet, plugged back and casing landed at 5200 feet. Perforations will be made in a 2½-foot sand section at 5132-34½ feet where a drill stem test recovered 1050 feet of oil with 58½ pounds pressure in 10 minutes. The test is located in Block 2 of the Dibrell, Sawyer and Gallagher subdivision.

Several important extensions and sand discoveries were uncovered in the Agua Dulce-Stratton sector of Nueces County. Recently, oil production was found in the east flank of the Stratton distillate structure. During the past week, exploration was carried northeast, opening new pays on the flanks of the Agua Dulce field.

Richardson Petroleum Company's Zula McCoy 2, Share 2 and southeast of Agua Dulce production, was drilled to 7050 feet, casing being landed on bottom. Perforated at 6876-85 feet, a drill-stem test recovered 1300 feet of 41-gravity oil under 250 pounds working pressure in 12 minutes. A second test through perforations at 6715-21 feet flowed 40-gravity oil in 16 minutes, pressure rising to 90 pounds. A third sand, around 6000 feet, was being tested. Each sand is a new oil zone for the field; however, they correspond closely to the distillate sands already opened.

Baytex Oil Corporation's Union Central 2 cored a sand at 6394-6405 feet and on a drill-stem test of 10 minutes duration, seat slipping, recovered 320 feet of oil, no pressure, plus considerable mud. A drill-stem test of sand 6515-32 feet recovered 1110 feet of oil and 95 pounds pressure in 8½ minutes. A test was being made on the 6600-foot sand late in the week. It opened two additional pays for the eastern portion of the Stratton field. The first well on the same lease, located 853.3 feet west, opened the 6600-foot pay several weeks ago.

Several more sands recently have been found on the east flank of the Stratton field. These lenses, together with the ones encountered during the past week, will bring a heavy drilling program to this area.

Wilcox Development

South Texas Wilcox development late in the week was centered around a deep test in this formation in Atlantic Refining Company's Conwell 1, one mile northeast of the lone producer which opened the Thomaston field in Dewitt County. Although it is being drilled as a closed operation, it is generally understood that it is being swabbed from 90 perforations at 9790-9815 feet. This sand, indicated by electric log, is more than 2000 feet below the top of the Wilcox formation and if productive would be the deepest in the zone thus far completed. The company's distillate production in this formation is from 7800 feet, just below the top of the zone. The discovery sand was found at 7892-7942 feet, a new sand at 9105-60 feet and the zone being tested at 9798-9850 feet. The hole is bottomed at 9952 feet with casing set on bottom.

LaSalle County's Washburn field has its second operation underway. H. R. Cullen's Washburn 2, in Section 67, located 4500 feet northeast of the discovery producer. The first well was finished through perforations at 4860-67 feet, or 1248 feet below the top of the Wilcox zone.

In Live Oak County, Edwin M. Jones was still testing West 1-B, discovery of the George West Wilcox-sand field at 8387 feet. He was having some trouble overcoming the high gas volume coming with the 47.4-gravity oil. It is possible that a squeeze job will be attempted. The well is producing from 1 foot of open hole below the drill pipe cemented in the hole, and the problems have been numerous.

Salt Water Delays Valley Producer

Salt water intrusion has delayed completion of a wildcat producer which will be the discovery of a new field or a two-mile northeast extension to the North Rincon area of Starr County. Sun Oil Company's Mateo Saenz-State 1, survey 80, perforated at 5502-05 feet, tested water, reperforated at 5499-5500 feet and on drill-stem test made 9 barrels of fluid per hour, 5 percent oil and the remainder water. Additional tests are scheduled. Several sands were encountered in the well and a commercial producer ultimately is expected.

Immediately offsetting the North Rincon field discovery to the east, The Texas Company's Davenport-State, Section 78, was abandoned at 5523 feet. It showed gas at several levels and found minor oil showings. Immediately south of the same discovery, Arthur Harvey's Davenport 1, on a Sun Oil Company farmout, was at 5200 feet with casing set.

An extension of nearly a mile to the southeast in the crude sector of the original Rincon field, Starr County, is apparent in W. R. Davis, Inc.'s Slick 17-A, which is testing through perforations at 3952-73 feet. No gauge was available.

Royal Oil & Gas Company skidded 427 feet east of its wildcat wild gas well in Hidalgo County and has commenced Yturria 1-A. The first well blew out from a 3100-foot sand, was partly controlled and is still bleeding off excessive gas. An effort will be made to further control the operation upon completion of the present test. Located 7000 feet east of the Samfordyce field, it is considered the discovery of a new producing area.

New Fields, Extensions in Mirando Area

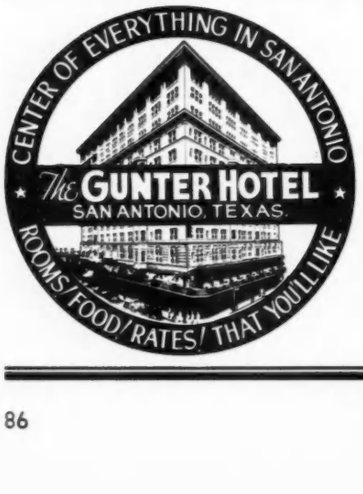
Two new fields and two key field extensions resulted from wildcat exploration in the Mirando district during the week. All wells are in the Jackson-Cockfield formation, and are in sectors where additional drilling may be anticipated. Duval shared two of the discoveries, while Webb and Jim Hogg Counties each had one.

Guy A. Davis et al's Holbein (Marrs McLean) 1, three miles east of the Henne, Winch & Fariss pool in Jim Hogg County, after perforating at 2795-2811 feet with 48 shots, flowed 85 barrels of 26-gravity clean oil per day. It is flowing through flow valves and has a low gas pressure. The well originally had been drilled to 3150 feet, testing the Yegua zone, then being plugged back for completion in the Manila sand at 2795-2811 feet. It is in Section 4, on a 2000-acre block held by Davis.

One mile south of the Glen pool and just across the Webb County line in Zapata County, Jay Simmons' Yeager-Strohman 1, NW S½ Section 258, cored six feet of saturated Glen sand at 2172-78 feet and casing was set atop the pay.

Magnolia Petroleum Company apparently has opened a shallow Cole-sand field in the extreme northwestern portion of Duval County. Duval County Ranch Company 1, GS&SF Section 289, was shut in after gauging 2,060,000 cubic feet of gas per day through ⅜-inch choke under 325 pounds pressure. The well had been drilled to 2212 feet, set casing at 1040 feet, and perforated at 1003-06 feet for completion. It is one mile west of Casa Blanca.

Gilcrease Oil Company was still working on Salizar 1-B, Alanis Survey 3, one mile southwest of the Hoffman field, Duval County. The test is in the upper Government Wells sand at 2616-34 feet, this zone corresponding to production in the Hoffman field. The test was underway through perforations at 2632½-34 feet, where the well was flowing at the rate of about 14 barrels of oil per day through ⅜-inch choke. It was showing a high gas volume under 750 pounds working pressure.



Where OILMEN MEET in SAN ANTONIO

Rig yourself up at the Gunter where you'll find all your own friends enjoying the same warm hospitality, unexcelled food, and modern accommodations that will make your visit a success!

550 ROOMS . . . 550 BATHS . . . 4 FINE RESTAURANTS

300 GUEST ROOMS . . . AND ALL PUBLIC ROOMS

AIR-CONDITIONED

"ARTIE" COMPTON, Gen'l Mgr.

Texas Gulf Coast

Hockley Promised Commercial Production; Activity Down

First commercial production at Hockley dome, Harris County, was indicated as Jordan Drilling Company's Warren Minerals Company 1, work-over of The Texas Company's Warren Minerals 15, was pumped for an estimated 70 barrels of 24-gravity pipe-line oil daily after flowing a small amount from 2096-2106 feet. This 117th test of Hockley possibilities formerly produced a small amount of oil from the same horizon and was deepened to the salt without success. Several wells have produced intermittently from cap rock and Frio between 1800 and 2400 feet, with cumulative production through 1935, the date of abandonment, being 24,000 barrels.

Drilling activity declined further during September, the 60 completions registered making the 9-month total 943, or 10 percent below the similar period of last year. Rigs in service, 135 in number, indicated an increase over October 1, 1939, and September 1, 1940, that should serve to sustain the flagging completion rate.

No official gauge had yet been made on Harrison & Abercrombie's Sun Oil Company Fee 1, recent discovery at Shepherd, eastern San Jacinto County. The well was flowing from Wilcox at 8217-70 feet at an estimated rate of 77 barrels of 58-gravity distillate daily through a series of chokes installed to combat freezing troubles which have prevented a gauge. No outlet has been arranged for this field, around which discovery operators hold 20,000 acres.

At Bailey's Prairie, Brazoria County, Glenn McCarthy continued to test the 10,350-foot 24-gravity production from Munson 1, depth record holder for the upper Texas Gulf Coast. The well initially tested 9 to 10 barrels hourly through 11/64-inch choke from 11,345-11,349 feet, with no salt water. Salt water intruded and increased to 35 percent of total volume.

In the Rowan field, Brazoria County, Rowan & Nichols and Texas Gulf Producing Company found gas with oil cut in the discovery sand at 8554-85 feet and was deepened to 8900 feet where operators prepared to core the sand tested in the discovery and confirmation wells. Texas Gulf Producing Company augmented activity by moving in materials for Moore '1, 2000 feet west of production. Stanolind Oil & Gas Company's Hodnett 1, south offset to the discovery, was below 7500 feet.

The Dyersdale field, Harris County, promised to become one of the most active of the 1940 discoveries as J. M. English staked Stewart 1, north offset to H. C. Cockburn's Burkett 1, 4060-foot Frio discovery. H. C. Cockburn's Burkett 2, west offset to the discovery, was spudded last week. The discovery has been assigned an allowable of 150 barrels daily and exempted from shut-down orders.

Galveston Bay activity saw abandonment of two Humble Oil & Refining Compan ywildcats: State B-1-288, 4 miles southwest of Red Fish Reef, dry at 9573 feet, and State C-1-45, Fishers Reef area, quit at 9300 feet. The company spudded two new wildcats to maintain Gulf marine activity at its highest level: State C-2 set conductor pipe at 195 feet, and State B-6 drilled out of conductor at 200 feet. Only one well in the Bay program was in a critical stage. Humble Oli & Refining Company's State A-2, confirmation attempt at Red Fish Reef, was running tubing to bottom at 9851 feet, with perforations at 9762-72 feet. State A-3, 1 mile west of the Red Fish Reef discovery, was drlling at 6963 feet. Shell Oil Company has applied to the U. S. Engineers office in Galveston for permit to drill on State Tract 198, 2 miles southwest of Smith's Point. The company's State 1-199, off Smith's Point, was drilling near 3000 feet. The Texas Company's State 1-237, on the Elm Grove prospect in East Bay, was drilling past 8000 feet.

At Raccoon Bend, Austin County, Humble Oil & Refining Company abandoned Hardy Y-7, 7500-foot Wilcox test. In Woodley Y-17 the company drilled retainer at 6998 feet after perforating for cement at 6994-7008 feet. This Wilcox test was drilled to 8564 feet, well into the Wilcox, and plugged to 7020 feet after test failures in that formation.

Gulfboard Oil Corporation abandoned Milburn 1, Halls Bayou prospect, Brazoria County, at 9250 feet, after topping Frio near 9000 feet and testing salt water in all sands. Objective was the 9160-foot horizon which produces at Alta Loma, Galveston County. This test was reported to have run over 100 feet higher than The Texas Company and Glenn McCarthy's Kainer 1, recent 10,000-foot failure in the area.

Rowan & Nichols spudded and drilled out of surface casing in Duplex Melancon 1, wildcat in the Garish Survey, Pine Island prospect, Jefferson County. Dick Schwab was drilling below 1500 feet in Stark & Brown 1, wildcat northwest of Mauriceville, Orange County. Wildcat interest in Matagorda County centered in Ohio Oil Company's Blackburn 1, Sugar Valley test which was drilling below 4750 feet, and Helmerich & Payne's Herman 1, same prospect, drilling near 3600 feet.

Set Sugar Creek Rules

The Louisiana Conservation Commission has set a 40-acre space rule for the Sugar Creek field, Claiborne Parish, which now has four oil wells. The field's October oil allowable was set at 502 barrels, with augmented allowable of 671 barrels, alloting 75 percent to acreage and 25 percent to bottom-hole pressure. The gas limit has been placed at 1,341,600 feet.

Louisiana Gulf Coast

September Activity Declines; Bayou Perot Extended ½-Mile

South Louisiana activity declined in September, counting only 65 completions, but the considerable excess over last year was not seriously affected, the 800 completions made during the first 9 months of 1940 being 50 percent more than the total at September 1, 1939. Indication that so wide a margin may not be maintained during the rest of the year may be seen in the decline of active rigs, of which there were 123 at October 1, 1940, compared with 133 at that date a year ago.

Bayou Perot field was extended ½ mile east into Jefferson Parish by The Texas Company's State-Bayou Perot 1, Section 6-17s-23e, completed for a new sand at 8770-8820 feet. Flow was 740 barrels of 35-gravity oil daily through ¼-inch choke, with tubing pressure 1300 pounds, casing sealed. The discovery, Tide Water Associated Oil Company's Delta Farms 1, was completed early in the year at 11,290-305 feet for 162 barrels of 31-gravity oil daily through ⅛-inch choke. This company's second test, Delta Farms 2, was fishing for stuck drill pipe at 11,350 feet in side-tracked hole. The Texas Company completion was reported to have logged five sands, testing dry gas under 2800 pounds pressure from 9745-60 feet. Bayou Perot thus becomes the fourth of the 11 1940 Coastal Louisiana oil discoveries to be confirmed, the others being Neale, Beauregard Parish; West Cote Blanche, St. Mary Parish and Bayou Pigeon, Iberia Parish.

Attempts of Humble Oil & Refining Company to confirm the Erath field, Vermilion Parish, were delayed by discovery of a leak in the casing, set at 11,670 feet, in Vermilion Parish School Board 1, ½ mile west of The Texas Company's discovery well. This semi-wildcat cored sand with gas odor at 10,379-380 feet, hard sand with no show at 11,388-389 feet, sand with gas odor at 11,390-405 feet, sand with shale streaks at 11,400-420 feet, six feet of sand at 11,480-490 feet, with upper three feet gas, lower half oil. If the well does not produce, the situation at Erath, where two dry tests followed the discovery, will not be favorable to much further development.

Iowa Sand Confirmed

Magnolia Petroleum Company confirmed its recent discovery of an 8200-foot productive level at Iowa, Jefferson Davis Parish, by completing Waite 4, deepening job, through perforations at 8225-35 feet for 800 barrels daily via ¼-inch choke. The work-over campaign now in progress in this field was set off by the company's completion of Waite 9 for 1560 barrels of 34-gravity oil daily through ⅛-inch choke from 8204-39 feet. Waite 14, third well on the program, was drilling 900 feet above the sand. Royalty prices in this 9-year-old field have been boosted from an already high base, and there have been reports that other companies would participate in the development soon.

At Welch, Jefferson Davis Parish, Cheesman and Cranston were preparing to retest Bourgeouis 1, first flank sand discovery on this old salt dome. Latest gauge, 24 barrels of 39.5-gravity

oil daily through ¼-inch choke from 5320-26 feet, was cut by strong salt water flow. Union Sulphur Company's Fontenot 1-B, Section 35-9s-5w, southeast flank test, was drilling below 8600 feet.

Barnsdall Oil Company will retest Point Au Fer prospect in Terrebonne Parish, making location for Nelson Development Company 2, Section 3-21s-11e, 500 feet west of Nelson Development Company 1, abandoned in May at 11,700 feet after several tests near 7400 feet. Only other test on the ten-year-old torsion balance and seismograph prospect was Freeport Sulphur Company's Nelson 1, 6023-foot dry hole.

Cameron Parish received two interesting wildcat starts. On the heels of their 13,610-foot failure in State-Lake Calcasieu 3, Superior Oil Company staked State 4, deep test 660 feet northeast of the dry hole which was the deepest ever drilled in Louisiana. No projected depth was announced, nor was the reason for the company's confidence apparent in the records of their first three tests. Danciger Oil & Refining Company located Mallard Bay Land Company 1, Section 23-13s-3w, 6 miles southeast of the Grand Lake field. The 12-year-old prospect is the site of five dry holes.

Humble Oil & Refining Company located Freeland 1, semi-wildcat 1 mile south of Leger 1, recent discovery at South Crowley, Acadia Parish. Location is in Section 27-10s-1e. Company's Leger 2, confirmation attempt, was drilling past 7900 feet. In Assumption Parish, the company staked Michie 1, wildcat on the Labadieville prospect, Section 108-14s-15e, a mile northwest of Sugars 1, 12,600-foot dry hole. This is the fourth test for this 7-year-old prospect found by Shell Oil Company.

Despite the deterring influence of Act 77, recent legislation on geophysical exploration, several parties were in the field. In Acadia Parish, Union Sulphur Company was working Townships 7s-1w and 7s-2w, as was Cities Service Oil Company in Townships 11s-10w and 11s-11w. Amerada Petroleum Corporation had seismograph crew on the Lake Misere prospect, 14s-5w, Cameron Parish. In the same parish, Gulf Refining Company was working the Cameron Meadows area. Atlantic Refining Company had a crew in Allen Parish, Township 2s-6w. In Evangeline Parish, Sun Oil Company worked the Pine Prairie prospect, Townships 4s-1w and 4s-2w. Republic Production Company was making gravimeter survey in East Feliciana Parish. In LaFayette Parish, Continental Oil Company was using seismograph in Township 9s-4e. In St. Landry Parish Amerada Petroleum Corporation was shooting the Melville area, 4s-7e. Pan American Production Company and Atlantic Refining were active in St. Mary Parish, the former in Township 14s-10e, the latter in Townships 16s-9e and 17s-9e. The Texas Company had a crew in Townships 16s-7e and 16s-8e. The California Company was using seismograph on the Lake Eugenie prospect, St. Bernard Parish, and on the Pecan Island prospect, Vermilion Parish. Humble Oil & Refining Company was shooting in Townships 3s-10e, Washington Parish.

North Louisiana

Olla Productive Area Defined by Fiftieth Test

With 49 producing wells in the Olla shallow field, LaSalle Parish, first definite defining of producing limits for that Wilcox-sand field occurred last week when a ¾-mile north outpost across the line in Caldwell Parish was abandoned at 3032 feet. The abandonment is H. L. Hunt's Cross 1, SE SE 18-11n-3e. Nearest production was a gas well owned by Hunt and completed last June in the early days of the field. Olla added five oil wells last week.

Hunt's Goodpine A-2, C SE NE 9-7n-3w, near the same operator's recently completed 35-barrel oil well in a wildcat area near Jena, has set producing casing at 3820 feet.

Another 10,000-foot hole was added to North Louisiana's list last week when Ohio Oil Company's Taylor 15, Account 1, SW SE 15-23n-8w, was drilling at 10,098 feet. It is in the Haynesville field, Claiborne Parish.

V. A. Hardin's Valentine 1, NW NW 31-20n-6w, Claiborne Parish wildcat, which had stuck drill stem at 6120 feet, is reported to have cleaned hole and was running electric log. Union Producing Company's Garrett B-1, CW½ SE 33-12n-16w, DeSoto Parish wildcat, drilled at 6109 feet after showing 60 feet of mud cut with distillate and gas in a 20-minute drill-stem test. The same company's Meadows A-1, C NE 18-21n-4w, two miles north of Lisbon, drilled at 8088 feet in shale after 1 foot of a 20-foot core at 8040-60 feet showed gas odor.

Atlantic Refining Company will drill a wildcat test, L. & A. Oil Company 1, SE 29-9s-2w, Winn Parish, adjacent to the Angelina-Caldwell Flexure and on the southeast flank of the Sabine Uplift.

Henry A. King's Heilborn & Kay 1, D. & S. E. Railroad Survey, Cass County, Texas, wildcat was shut down at 4202 feet and probably will abandon at that depth despite a slight oil stain in a core at 4150 feet. Location is 10 miles northeast of Atlanta. In Harrison and Marion counties, J. D. Parsons of Jefferson plans a Paluxy-sand wildcat on a block around the Alexander Albright Survey.

South of Glen Rose gas-distillate production at Joaquin, Shelby County, Paul Pewitt's Swan 1, Ann Gray Survey, showed salt water at 5125 feet.

Arkansas

Only Two Completions Reported During Week

Only two completions were recorded last week in Arkansas, one a small pumper in the Lewisville-Stamps field, LaFayette County, and the other a 650-barrel flowing well in the Nick Springs offshoot of the Rainbow City field, Union County. This area produces from the Travis Peak. The new well is Fohs Oil Company's J. D. Dunbar

So What?

If you don't do business with PELCO we can't very well convert you with what persuasion can be gotten into this small space. But a great many heavy buyers have been persuaded by something over the last 30 years or so. If we encourage you to look and listen we may get you yet. And you'll probably like it. Everything made and/or sold under the PELCO Trade-Mark has the respect of oil men in the area we serve. So what? Nothing. Just store it away in the back of your mind for possible future reference.

PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT
LOUISIANA

PELCO

Houston
Greggton
Berwick
Houma
New Iberia
Magnolia

1, NE SW 31-17-14, producing from 3766 feet.

A southeast edge well is due the coming week from the Smackover lime in the Dorcheat deep field, Columbia County. McAlester Fuel Company's (J. G. Puterbaugh) K. J. Sayers Unit 1, C NW NE 15-18-22, is waiting on final 5½-inch casing set at 8911 feet, 9 feet off bottom. This test topped main porosity in the Smackover lime at 8824 feet, 21 feet below top of this contact. Elevation is 268 feet.

Arkansas Permits

Three drilling permits were authorized last week by the Arkansas Oil & Gas Commisison, as follows: Arkansas County—Jay Oil Company's Trice 1, CNE SW 16-2s-3w; Nevada County—Berry Asphalt Company's Mary Jackson 4, NE NW NE 9-14-20; Union County—McCreslenn Oil Company's R. Howe 1, SE SW SW 3-18-13.

Arkansas Field Rules

The Arkansas Oil & Gas Commission has set a 10-acre space rule for the Crain pool of the old Urbana field, Union County, and for the Nick Springs offshoot of the old Rainbow City field, Union County.

Olla Field Hearing

The Louisiana Conservation Commission has called a hearing at the Monteleone Hotel, New Orleans, for October 9 to discuss production and space rules for the Olla field, LaSalle Parish, which has approximately 50 wells producing from the shallow Wilcox.

Southeastern States

Two More Flowing Wells in At Tinsley; Third Needs Pump

Two new oil wells were completed last week in the Tinsley Dome field, Yazoo County, but another refused to flow and showed considerable salt water. The latter will be standardized. All are operations of Union Producing Company, discoverer of the field.

The company's Robinette Estate 2, NW NE 19-10n-3w, drilled to 4935 feet and electrical log run, was completed flowing 77 barrels of oil in first 4 hours through 13/64-inch choke with tubing pressure 255 pounds and casing pressure, 215 pounds. The same company's Partridge 3, located 526 feet west and 2012 feet north SEc 1-10n-3w, was swabbed in flowing 46 barrels in 4 hours hours through 24/64-inch tubing choke with 30 pounds tubing pressure and 120 pounds casing pressure, following perforations with 100 shots from 5260-80 feet and with 94 shots from 5242-60 feet. Total depth is 5291 feet.

Union Producing Company's Twiner 6, NE 1-10n-3w, drilled to 6233 feet and plugged back to 5450 feet, is waiting on pumps after swabbing salt water and showing 2160 feet of oil and 1170 feet of salt water in a 3-hour drill-stem test with ⅜-inch chokes top and bottom, following perforation of casing with 100 shots at 4838-54 feet and with 60 shots at 4954-64 feet.

Two wildcat tests, one in Attala County and another in Newton County, were abandoned. Two new wildcat locations were made in Grenada County, one by H. T. Salter in Section 6-21n-7e, and the other by James Papadakis of Houston, Texas, for a 5000-foot test (or to the igneous) in Section 13-22n-2e, location being on a 12,000-acre block. J. Harper and associates are planning an early test to 4000 feet on a 6000-acre block in 17n-4e, Carroll County, between a block held by J. P. Evans of Shreveport in 18n-3e, and Atlantic Refining Company in 17n-1 and 2e.

Jones & Crosby of Fort Worth, were to run electric log to 4500 feet in Tussaloosa (Woodbine) in Allen 1, SW SW 33-13n-5e, Attala County wildcat, where a slight odor of oil was reported in a core just below 4400 feet. This test topped chalk at 2969 feet (elevation 290 feet).

Reported approximately 280 feet high, T. N. Smith's (San Antonio) Hollified 1, NW SW NW 20-8n-12w, Jones County wildcat, drilled chalk below 5840 feet after topping Wilcox at 1906 feet; and chalk at 5673 feet (elevation 414 feet).

Five miles northeast of the Tinsley Dome field, Yazoo County, R. J. Dean, former Illinois operator, now residing at Yazoo City, will drill a 5200-foot wildcat in Section 10-11n-2w. Contract was let to I. W. Love to start opera-

DON'T LET TUBING SLAM-BANG IN THE WELL

Protect it with

PATTERSON-BALLAGH TUBING PROTECTORS

Tubing, without protection, takes a terrific beating in the well. Cushion its contact by use of Patterson-Ballagh Tubing Protectors. Made of molded, reinforced plastic, fabricated onto the collar. Gas and oil-resistant.

See Composite Catalog

PATTERSON-BALLAGH CORPORATION

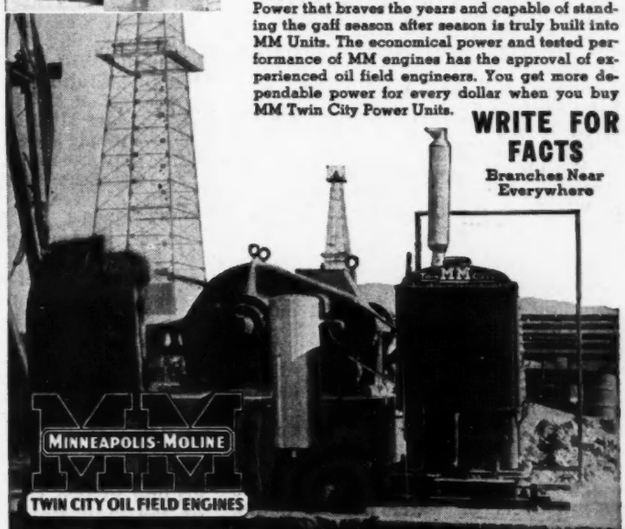
Los Angeles, Houston, New York City

They take the Beating

The most important job of an Engine in the oil field is to deliver maximum power without a falter or hesitation. MM engines have a perfect score on these points. They have been working hard and long for years under the most brutal service. The Power that braves the years and capable of standing the gaff season after season is truly built into MM Units. The economical power and tested performance of MM engines has the approval of experienced oil field engineers. You get more dependable power for every dollar when you buy MM Twin City Power Units.

WRITE FOR FACTS

Branches Near Everywhere



MINNEAPOLIS-MOLINE

TWIN CITY OIL FIELD ENGINES

MINNEAPOLIS - MOLINE POWER IMPLEMENT COMPANY MINNEAPOLIS MINNESOTA

tions by October 8. Carter Oil Company is reported to have farmed out part of its block around Section 24-11n-3e, near Canton, Madison County, for an immediate test and will either drill or farm out acreage in Section 30-12n-2e, in the Pickens field, Yazoo County, which with only four small wells has proved a disappointment.

Sun Oil Company has two gravimeter units working its 100,000-acre block in Pearl River County, South Mississippi. Magnolia Petroleum Company has taken 30,000 acres of commercial gas leases on acreage in Conecuh, Escambia, Monroe and Washington Counties, Alabama. Humble Oil & Refining Company is leasing actively in Forrest County near Hattiesburg.

Last week's compilation showed 58 geophysical units working in Alabama and Mississippi.

Glenn D. Rose and H. L. Ray, Texas operators, have moved in rotary rig for a 5000-foot test, James Fowler 1, 6 miles northeast of Soperton, Truetlen County, Georgia. Reports have been current that another Georgia test will be drilled soon in Grady County near Cairo.

Postpone League City Hearing

The Texas Railroad Commission has postponed indefinitely its hearing on the League City field, Galveston County, which had been called to consider revision of the method of allocation. Phillips Petroleum Company had requested that bottom-hole pressure be substituted for potential in allocating production in the field.

California

Outpost to Dominguez Flows 1000 Barrels From 7500 Feet

R. E. Havenstrite, who opened a northwest extension to the Dominguez field of Los Angeles County, completed Larronde 4, a northwestern outpost, bottomed at 7636 feet flowing 1000 barrels daily of 31-gravity oil, cutting 1.6 percent through a 28/64-inch bean with 300 pounds pressure on tubing. Production is from the seventh and eighth Callender zones, topped at 7112 and 7590 feet, respectively.

In this same area in Section 31-3-13, Wood-Mellon Oil Company's Wood 1, wildcat originally bottomed at 7498 feet, was redrilled and whipstocked 500 feet southwest of surface location where shale with streaks of sand showing faint to fair cut was cored in top of the sixth Callender at about 6640 feet. Next few cores are expected to determine whether commercial production will be found in the zone.

Shell Oil Company completed three wells in its Ten Sections field, Kern County, adding 5129 barrels daily to company's potential output in that area. Largest of the completions was KCL A-2-29, Section 29-30-26, completed for 2336 barrels daily of 33.8-gravity oil and 2,043,000 feet of gas. A new casing program was used on this well, a full string of 4½-inch perforated at 8096-8235 and at 7955-8054 feet, being landed at 8235 feet and cemented at 7950 feet. Only other casing in the hole is 8½-inch surface pipe cemented at 999 feet. Company is currently operating eight drilling strings in various California fields.

Richfield Oil Corporation resumed drilling in Tejon Ranch 1, wildcat in Section 2-10-19, Kern County, at 7055 feet and was coring sandy siltstone. The project is the first of some ten scheduled wildcat ventures to be drilled by the company to test an area of about 50,000 acres in the southern end of the San Joaquin valley. Related to the general study of these holdings is a second test being drilled by company at Wheeler Ridge, KCL-2 in Section 28-11-20. The project, a deep test, was drilling in sand and shale at 7935 feet.

Pacific Western Oil Corporation was expected to plug back to 11,343 feet in Meyer 1, in the Wasco field, and whipstock southeast. Bottomed at 13,150 feet, formation tests looked wet. Location is in Section 7-27-24.

Royalty Service Corporation will drill in the Delano area of Kern County where it has leased 2100 acres.

Continuing exploration efforts north and west of Coalinga, Fresno County, The Texas Company was drilling in shale at 9252 feet in Everding 1, Section 24-17-15. Base of the Kreyenhagen was encountered at 8830 feet, and faint stringers of gas sand and gray sand were reported at 8831-47 feet. Top of the producing zone equivalent to that found in S. P. 1 in this area is expected near 9490 feet.

Six miles southeast of Piru, Ventura County, R. N. Ferguson leased 700 acres in the Eureka Canyon area and was building roads. Core-hole drilling will be undertaken before location is staked for a test. A portion of the property lies about ¼ mile from a group of shallow wells owned by the Century Oil Company.

After coring top of the Vedder at 2480 feet in Section 11-26-27, Mount Poso area, Kern County, Crestmont Oil Company abandoned Smith 1, wildcat. Hole was bottomed at 2504 feet. In this same area, Section 18-26-28, Universal Consolidated Oil Company topped Jewett silt at 1842 feet and the Vedder at 1918 feet in Villard 1. The wildcat was abandoned after entering gray barren sand at 1928 feet.

Ask Clearance for Oil From Wild Stanolind Well

Stanolind Oil & Gas Company has requested permanent clearance of 336,000 barrels of oil produced from its John A. Hulen 1, which went wild in the Alta Loma field. Testimony presented at the hearing showed the commission had been advised of work done on the well, which was finally closed in when a directional well was completed. The well began flowing wild on May 18, and produced continuously until August 2.

M. M. Montgomery, petroleum engineer for the company, stated that $306,000 had been spent by the company in its efforts to control the well, including cost of the directional hole.

Michigan

Drilling Starts on Test Projected as State's Deepest

Gulf Refining Company started to make new hole on Bateson 1, Section 2-14n-4e, Bay County, first projected 9000-foot test in Michigan's history. It was originally drilled to 4059 feet in 1939 and then plugged back to 3817 feet and produced from Monroe limestone oil pay.

Rotary was moved in late in July, but actual drilling operations were delayed to fish out part of a string of 3-inch tubing, in an attempt to cement off the old oil pay, and to pull the old string of 8-inch and re-set 3625 feet of 9-inch casing through the Monroe. Test was drilling new hole at 4075 feet.

None of several promising Basin wildcats had been completed successfully due to a combination of troubles. Sun Oil Company's State A1, Section 35-20n-6w, Winterfield Township, Clare County, which flowed by heads 96 barrels first 24 hours and 156 barrels first 49 hours, started to cut from 5 to 12 percent water and plans to acidize were postponed. Operators had the wildcat on the pump with a recovery ranging around 30 barrels of oil and 5 to 9 barrels of water per 24 hours. State A1, topped Dundee at 3794 feet and bottomed at 3797½ feet. It is five miles north of the Temple oil field.

Five new starts were reported for Bloomfield Township, Huron County, but Cryden Oil Company's McDonald No. 1, Section 20-17n-14e, a wildcat, had a bad fishing job with two strings of tools in the hole. Tools were lost when the 5-inch cement plug was drilled out three weeks ago. Well flowed as high as 7½ barrels per hour natural from Traverse at 1427 feet, and last week was flowing from 15 to 40 barrels per day past tools.

Vic R. Wilson's Cook 1, Section 4-10n-2w, Gratiot County wildcat, was under test at 877 feet with 824,000 feet of gas from Michigan Stray sand. Originally intended for a Dundee test, operators may complete for gas. Stray top was logged at 866 feet.

Ora A. Avery's Dunnwort 1, Section 13-6s-11w, St. Joe County wildcat, logged oil saturation in Trenton limestone at 2625-2670 feet, and was shot with 200 quarts of nitro.

Weber Oil Company's Gabel 1, Section 31-18n-10w, Osceola County wildcat, deepened from 3629 to 3630 feet and operators prepared to set 2-inch tubing with a packer and acidize a Monroe lime pay. Test topped lime at 3625 feet, and over a 14-day test swabbed 65 barrels of oil.

Transwestern Oil Company developed its first Michigan production, drilling in two shallow Traverse wells on the same lease in the North Overisel pool, Allegan County. Brink 1, Section 16-4n-14w, carried 400 feet of oil at 1533 feet, and Brink 2, Section 16, flowed 6 barrels per hour natural at 1525 feet.

UNITED STATES WELL COMPLETIONS

ARKANSAS

La Fayette County (Lewisville-Stamps)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Erwin, Leach et al, Bell B-2, 19-16-22	25	3460

Union County (Nick Springs-Rainbow City)—

Fohs Oil Co., Dunbar 1, 31-17-14	650	3766

California

Kern County (Mt. Poso)—

Cresmont Oil Co., Smith 1	*	2504

Kern County (Round Mountain)—

Trico O. & G. Co., Coffee 4	275	1376

Kern County (Ten Sections)—

Shell, KCL A-78-29	1315	8220

Los Angeles County (East Coyote)—

George Morgan, Fricke 2	150	2070

Los Angeles County (Dominguez)—

R. E. Havenstrite, Larronde 4	800	7636
Shell, Reyes 107	528	7450
Union, Callender 81	No Est.	7618

Los Angeles County (Montebello)—

Kern Oil Co., Monterey 27	502	7785
McVicar-Rood Montebello, Manz 4	550	7758

Los Angeles County (Rosecrans-Athens)—

Southern Calif. Pet. Corp., No. 12-1A	180	8214

Los Angeles County (Seal Beach)—

Continental, Bixby 18	95	4919

Los Angeles County (Wilmington)—

Alvan Pet. Co., Management 11	500	3733
Union Pacific, UP 154	226	3942
UP-E28	15	3379

Orange County (Huntington Beach)—

Termo Co., Fee 6	300	5521

Orange County (La Habra)—

Security Land & Water Co., Security 1	*	5185

Ventura County (Ventura Avenue)—

Tide Water, Hartman 27	147	7860

Illinois

Bond County—

Magnolia, Griggs 3 se se se 4-6n-2w	28	1032
Kingwood Oil, Gaffner 1, sw se ne 30-6n-3w	*	2181

Clinton County—

Shell, Criley 19, cnw nw ne 2-1n-1w	69	1368
Sissler & Strawser, Barup 1, se sw nw 22-1n-1w	*	1511
Blalock, Bramler 2, sw se ne sw 2-1n-2w	*	1344
Arcadia Royalty, Bramler 1, sec sw sw 11-1n-2w	20	1322
L. L. Benoist, Knolhoff 3, nw sw ne nw 11-1n-2w	*	1220
Dick Duncan, Knolhoff 9, sw ne nw nw 11-1n-2w	45	1318
M. Jacobson, Knolhoff 4, nec sw 11-1n-2w	25	1212
B. E. Martin, Heinzman 1, sw nw ne nw 16-2n-1w	*	1470

Edwards County—

Tuesday Oil Co., Works 2, ne ne se 13-2s-10e	3600	3193
Whisenant et al, Dunk 1-A, cnw sw se 36-2s-10e	*	2500
Superior, Works 6, nw sw sw 18-2s-10e	250	3173
Works 7, 18-2s-11e	250	3099
Works 4, nec nw sw 18-2s-11e	900	3111

Effingham County—

R. H. Troupe et al, LaCrone 1, ne nw nw sw 7-8n-4e	42	1548

Fayette County—

Muhlback, Eberhardt 1, se ne sw nw 6-5n-3e	*	1652
Texas, Yakel 8, se ne sw 6-6n-3e	126	1576
Luttrell et al, Tucker 3, 130′ n of ne nw ne 21-7n-3e	75	1576
Stewart Oil, Logue 3, ne nw ne 34-8n-3e	*	1598
Carter, Finch 7, nw nw se 4-7n-3e	24	1595
Owen 4, ne se sw 8-7n-3e	22	1602
Hawkins 8, ne ne sw 17-7n-3e	120	1572
Algood 3, ne nw nw 2-8n-3e	108	1535
Phillips-Wood 2, se sw sw 36-9n-3e	30	1566
Workman 2, ne se sw 15-8n-3e	54	1527
Gregg 4, sw nw se 13-8n-3e	84	1538
Doty 13, sec se nw 13-8n-3e	Gas Inp	1488
Grames 13, nec sw sw 13-8n-3e	Gas Inp.	1525

Hamilton County—

Exchange, Friel 2, nw ne nw se 34-5s-6e	410	2969

Lawrence County—

H. J. Bowman et al, Shaw-Gray 2, cse se 13-4n-11w	*	1077

Madison County—

C. E. Baldwin et al, Diaber 1, ne se ne 23-5n-6w	*	1913

Marion County—

Petroleum O. & G., Kimsley 1, ne se nw 30-1n-1e	*	1508
Menhall, Benoist 5, se ne ne nw 8-2n-1e	Disposal	1640
Haynes & Thomas, Wallace 2, sec ne ne 36-2n-1e	*	2450
Thompson Dr., Craig 2, se ne ne ne 36-2n-1e	*	2261
Texas, Richardson 16, nw se ne sw 4-1n-2e	133	2095
Centralia 83, ne nw nw sw 4-1n-2e	105	2087
Centralia 77, sw se sw ne 5-1n-2e	408	1866
Hawthorne 35, nw ne nw se 5-1n-2e	210	1877
Richardson 13, nw se ne se 5-1n-2e	112	2095
Small 17, sw ne nw ne 5-1n-2e	196	2205
Foster 7, nw ne se 7-1n-2e	400	3496
Foster 8, se nw nw sw 8-1n-2e	1020	3520
Fyke 10, sw nw se 8-1n-2e	14	1913
Hawkins Comm. 8, e½ se nw 8-1n-2e	378	3536
Hawkins 22 e½ ne nw	455	3495
Kneinschmidt 18, 160′ n of ne nw ne 28-2n-2e	108	1864
Canull 27, sw sw se 31-2n-2e	215	2190
Canull 29, se sw sw se 31-2n-2e	Gas Inp.	1797

Mason County—

Bay Oil, Lake 1, ne ne sw 11-20n-5w	*	1535

Richardson County—

Al Stengle, Davenport 1, ce½ se ne 3-3n-9e	*	2985
J. J. Broadus, Blain 1, ne sw ne 24-4n-9e	19	2590
Texas, Winter 2, ce½ sw ne 27-4n-10e	68	3080

Saline County—

M. C. Trumbull, Bennett 1, s½ s½ s½ se 35-8s-5w	*	2950

Wabash County—

T. M. Baines et al, Wright 1, ne sw nw sw 8-1n-12w	55	1560
Leighty, Litherland 3, se sw sw nw 8-1n-12w	250	1555
Mohawk & Big Chief, Seibert 3 ne ne sw 34-2n-13w	450	2682
R. W. O'Meara, Gould 1, nw ne se 17-1s-12w	72	2053
Burr Lambert, Kalb 1, sw se se 23-1s-13w	*	2647
Sam Yingling, Seiler 2, se sw sw 26-1s-13w	120	2655
Tide Water, Seiler 2, ne nw nw 35-1s-13w	100	2656

Washington County—

Pitchford et al, Hafer 1, se ne nw 27-1s-1w	*	1654
Gardener Pet., Frederking 1, ne nw sw 28-2s-3w	*	1326
Leo Horton, Kosuzek 1, ne sw sw 23-3s-3w	25	1286

*Failures; †Junked; ¶Million cu. ft. gas.

[Continued on next page]

Summary of Drilling Operations in the United States, Week Ended October 5, 1940

	WELLS COMPLETED							*PERMITS FOR NEW WELLS				
	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1940	Total this Date 1939	This Week	Total this Month	Total 1940	Total this Date 1939	Year Total 1939
Alabama	.....	.....	.....	.....	.....	6	1	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Arkansas	2	2	.....	.....	675	144	185	3	3	115	180	223
California	17	15	.....	2	5,583	871	821	22	22	816	803	1,174
Colorado	.....	.....	.....	.....	.....	7	16	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....
Illinois*	87	64	.....	23	17,069	3,106	2,843	95	95	3,569	.....	893
Indiana	15	9	2	4	1,144	372	178	.....	.....	.....	.....	.....
Kansas	38	30	1	7	55,012	1,543	1,100	32	32	1,566	1,166	1,583
Kentucky	11	5	.....	6	780	271	503	.....	.....	.....	.....	.....
Louisiana	39	27	1	11	4,477	1,295	836	22	22	1,213	1,056	1,449
Michigan	13	5	2	6	1,857	937	1,135	32	32	885	1,092	1,419
Mississippi	4	2	.....	2	650	149	11	.....	.....	.....	.....	.....
Missouri	1	.....	.....	1	.....	17	.....	.....	.....	12	.....	.....
Montana	.....	.....	.....	.....	.....	144	109	.....	.....	.....	.....	.....
Nebraska	1	.....	.....	1	.....	13	1	6	6	24	.....	.....
New Mexico*	4	3	.....	1	1,388	516	493	9	9	465	125	293
New York†	16	16	.....	.....	45	787	466	.....	.....	.....	.....	.....
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	30	10	10	10	56	777	734	.....	.....	.....	.....	.....
Oklahoma	24	15	3	6	619	1,634	1,571	32	32	1,405	1,563	2,059
Pennsylvania	59	56	3	.....	58	2,841	1,218	.....	.....	.....	.....	.....
South Dakota	.....	.....	.....	.....	.....	1	.....	.....	.....	.....	.....	.....
Tennessee	.....	.....	.....	.....	.....	8	.....	.....	.....	.....	.....	.....
Texas	150	113	6	31	69,045	7,775	7,417	125	125	8,639	7,876	10,269
Utah	.....	.....	.....	.....	.....	2	.....	.....	.....	.....	.....	.....
West Virginia	10	3	5	2	18	434	421	.....	.....	294	436	718
Wyoming	.....	.....	.....	.....	.....	116	107	.....	.....	1	.....	.....
Total this week	521	375	33	113	158,476	23,767	20,168	378	378	19,004	14,297	20,080
Total last week	598	418	39	141	167,474	23,246	19,596	489	1,837	18,625	13,905	20,080
Total this year	23,767	17,296	1,349	5,122	8,410,930	.....	.....	.....	.....	.....	.....	.....

* This tabulation includes those states where weekly data are available; figures for Illinois date from October 15, 1939; New Mexico from August 1, 1939.
† Includes water-input wells.

United States Well Completions—*Continued*

ILLINOIS—Continued

Wayne County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Pure, Barth 3, se ne ne nw 5-1n-8e.	603	3095
Horton-Feller Cons. 1, se ne se nw 5-1n-8e	859	3110
Hubbell 1, w½ se se 5-1n-8e	206	3100
Miller 1, w½ sw se 5-1n-8e	160	3095
Trotter 1, e½ ne sw 5-1n-8e	205	3100
Roache & Voyles, Carlson 3, sw ne nw sw 3-2s-7e	86	3247
Jack Meyers, Covington 1, ne sw sw sw 4-2s-7e	238	3312
A. P. Muhlback, Cunningham 1, se nw sw 4-2s-7e	384	3301
H. Scott et al, Cornick 3, sw se sw sw 4-2s-7e	188	3334
Carl Robinson, Bonner 1, sw nw se 26-2s-8e	250	3386
Elliott 2, nw sw se 26-2s-8e	250	3404
Felix 1, se ne sw 26-2s-8e	103	3322

White County—

Duncan, Inc., Helm 1, se se nw 15-3s-14w	120	1823
Sun, Greathouse 14, nw se se 33-4s-14w	400	2595
Greathouse 16, ne nw se 33-4s-14w	300	2596
Wiser Oil, Hulett 2, nw sw se 23-6s-8e	992	3182
Westgate et al, Ervin 1, ne se nw 26-6s-8e	212	2080
Smokey Oil, Wilson 1, sw nw se 11-6s-9e	59	2274
Geo. Cameron et al, Leathers 1, nw ne sw ne 22-6s-9e	95	2244
Exchange, Angle-Storms 5, nw sw ne ne 22-6s-9e	78	2259
J. E. Mabee, Austin 1, ne sw ne 22-6s-9e	64	2265
Al Wilson, McAllister-Phillips 2, se ne nw 22-6s-9e	22	2256

Indiana

Daviess County—

Newton PL, Brittain 1, ne ne sw 15-1n-5w	*	2150

Gibson County—

Joe Bander et al, Cooper 9, nw sw ne 13-3s-14w	84	2138
Lewis Prod., Cooper 12, ne ne nw 13-3s-14w	207	2496
Papoose Oil Co., Cooper 13, ne ne sw 13-3s-14w	285	2873
Roberts Bros. et al, Hall 1, nw nw ne 20-1s-11w	¶1.5	2192

Hancock County—

J. H. Snyder, Cift 1, e½ e½ 17-15n-7e	*	996

Knox County—

W. C. McBride, Winkler 1, sw sw sw 24-2n-11w	344	1881

Posey County—

R. C. Crab, Maier 1, nw sw nw 33-3s-13w	115	2457
Gulf, Lang 4, sw nw se ne 7-6s-12w	25	1146
Nelson Development, Hortsman 3, sw nw nw 8-6s-12w	¶0.8	694
Paul Rossi, Egli 3, se se nw 19-6s-12w	71	2385
Jarvis Bros., Murphy Hrs. 1, sw se ne 35-3s-13w	*	2836

Spencer County—

Bowen Hoover, Rothert 3, sw nw nw 1-5s-6w	5	750

Vanderburg County—

Vanderburg Oil Corp., Hornby 11, se nw sw 33-5s-10w	*	2435
Hornby 12, nw ne sw sw 33-5s-10w	8	937

Kansas

Barber County—

Barbara, Trice "F" 1, cse 8-33-13w	*	4821

Barton County—

Cities Service, Bauman 5, cn½ ne sw 6-16-13w	3000	3355
Hollow et al, Kowalsky 3, cs½ ne ne 18-20-11w	3000	3300
Lario et al, Bryant 5, cn½ sw se 23-20-11w	3000	3279
Texas, Hoffman 10, cs½ se nw 6-16-13w	3000	3349

Butler County—

Adair et al, Cannon 2, se sw nw 15-28-7e	563	2686
Hay et al, Ferrel Ranch 3, sw se sw 21-28-8e (TD 3068)	15	2742

Cowley County—

Wixon et al, Clover 1, cw½ e½ 17-31-7e	35	2812

Ellis County—

Cities Service, McCord 2, se se nw ne 26-11-17w (OTD 3563)	376	3590
Deal et al, Bemis 3, cs½ nw ne 4-12-17w	378	3614
Dreiling 3, cs½ nw sw 4-12-17w	*	3634

Ellsworth County—

Cities Service, Kralik 1 cn½ nw nw 8-16-10w	3000	3290
Schroeder "A" 7, csl sw nw sw 29-17-9w	656	3243
Texas, Schroeder 2, cs½ ne sw 27-16-10w	3000	3290
Duwe et al, Rathburn 1, ce½ ne se 6-17-8w	*	3319

Grant County—

Panhandle Eastern, Dappert 1, nw nwc sw 28-30-37w	¶18.8	2799

Greenwood County—

Allison, Shore 1, nec 10-24-11e	*	1956
Katz et al, Christie 7, nw ne se 12-26-9e	10	2165
Hammer et al, Knight 1, ne se sw 4-28-11e	*	1302
Lemon et al, Anderson 1, cse se 5-28-11e	*	1258

Harvey County—

Magnolia, Smythe 4, sw nw ne 30-22-3w (OTD 3376)	65	3592

Johnson County—

McCain et al, Doan 1 csw nw 34-12-22e	*	1585

Marion County—

Larieux et al, Foxberg 4, se sw sw 21-17-4e	306	2440

McPherson County—

Stelbar et al, Wilson 1, ce½ se se 18-17-1w	413	2658
Central Pet. et al, Swanson 4 "B", ce½ se nw 18-20-5w	3000	3367
Carey, Knackstedt 3, cs½ ne sw 30-20-5w	3000	3323
Sunray, Johnson 4, cs½ sw ne 31-20-5w	151	3344

Rooks County—

Johnson, Luhman 2, cn½ se nw 10-9-16w	1790	3199
Broadview et al, Livengood "A" 6, cn½ sw nw 11-9-16w	2785	3206

Russell County—

Phil-Han, Letsch 4, se ne ne 34-14-13w	5567	2844
Cities Service, Ebel "A" 2, cs½ se sw 24-14-14w	947	3188
Skelly, Rein 5, ce½ se sw 25-14-14w	1441	2980
Hartman et al, Boxberger 3, cs½ se ne 26-14-14w	2172	2948

Stafford County—

Shell et al, Riley 1, swc 28-23-11w (TD 3772)	1342	3465
Stanolind, McComb 8, cn½ nw nw 12-24-11w	3000	3765
Hartnett 10, cn½ nw nw 13-24-11w (OTD 3772)	3000	3811
Crawford 1, cs½ se ne 15-24-12w	3000	3845
Sinclair Prairie, Krey 12, cwl sw ne ne 14-24-11w (OTD 3785)	3000	3825

Kentucky

Daviess County—

Ohio, Cooms 4	125	1256
O. D. Vickers, Johnson 3	240	1455
C. E. Daugherty et al, O'Flynn 9	*	1467

Edmonson County—

Kingwood Oil Co. & Ky. Nat'l Gas, Kyroc 1	*	1572

Hancock County—

W. J. Flescher, Burke 3	*	665
Burke 4	*	353
Rev. Hunger, Trustee, Johnson 3	*	524

Henderson County—

W. E. Hupp et al, King-Pruitt 1	295	1534

McLean County—

South Penn Oil, Kirtley 11	20	2014
J. C. Ellis, Edmons 1	100	1642

Ohio County—

P. P. Murphy, Carden 4	*	322

South Louisiana

Anse La Butte—

Crosby-Skelly, Republic 2	414	4783
Glassell, Breaux 4	332	4976
Stanolind Dupuis 1	360	4728

Bayou Blue—

Superior, Schwing 1	*	10,147

Bayou Perot—

Texas, State 1	470	11,108

Charenton—

Pan-American, Laws 22	*	2710

Darrow—

Humble, Community 30	454	4753

Edgerley—

Emerson, Hunter 15	200	3614

Eola—

Gulf-Tide Water-Andrau, Moulieire 6	324	8560

Garden Island Bay—

Texas, State 48	227	5915

Golden Meadows—

Dayvault, Myers 1	240	5490
Manetas, Collins 1	lcn	abnd
Frankes, Hatcher 1	lcn	abnd

North Crowley—

Humble, Williams 8	*	8801

Starks—

Lutcher-Moore, Fee 7	117	5022

Stella—

California, Delta Minerals 1-11	lcn	abnd

Sulphur—

Union Sulphur, Fee 870	259	6478

Venice—

Tide Water, Manhatten Fruit Co B-1	*	9853

West Cote Blanche—

Texas, State 5	*	5156

Cameron Parish—

Superior, State 3	*	11,575

St. Landry Parish—

Graham, Sibille 1, Bristol area	*	3617

North Louisiana

Bossier Parish (Bellevue)—

E. A. Jacobson et al, Arkansas Fuel Oil Co. 1, 13-19n-11w	*	581
Roy L. Reese et al, Bellevue Land Co. 1, 27-20n-11w	†	3035

Caddo Parish (Pine Island)—

J. W. Brown, Pitts 1, 18-21n-15w	10	1710
W. C. Curry, Spell et al 2, 28-21n-15w	20	1545
Stanolind, Dorian 3, 18-21n-15w	10	1732
Juan & McFatrick, Hobbs 3, 28-21n-15w	20	1515
Steve Reele, Brooks 1, 12-20n-16w	10	1550
E. O. Mitchell, Pirkle 1, 12-20n-16w	15	1563
R. B. Creager, Muslow 1, 4-20n-15w	80	1500
Davis & Hart, Muslow 3, 5-20n-15w	100	1502
Four Star Oil Co., Muslow 3, 5-20n-15w	110	1555
Southern O. & G. Co., Muslow 4, 5-20n-15w	20	1625

Caddo Parish (Wildcat)—

R. W. Crosby, Glassell 1, 11-19n-15w	*	2800

De Soto Parish (Naborton)—

District Oil Co., Frank Grocery Co. 1, 26-12n-11w	*	3006

La Salle Parish (Olla)—

Arkansas Fuel Oil Co., G. R. Lisenby Unit A-1, 12-10n-2e	115	2240
Placid Oil Co., La. Central Lbr. Co. 36, 36-10n-2e	195	2401
La. Central Lbr. Co. 46, 7-10n-3e	90	2700
La. Central Lbr. Co. 33, 30-10n-3e	85	2445
La. Central Lbr. Co. 45, 19-10n-3e	190	2398

Morehouse Parish (Monroe)—

United Carbon Co., Crossett Lbr. Co. 5, 19-21n-8e	¶2.0	2226

Red River Parish (Bull Bayou)—

Texas Co., Brinkerhoff B-37, 30-13n-10w	10	2504

Michigan

Allegan County—

H. C. Nelson, Balch 1, se se se 7-2n-15w	*	1292
Peters 3, nw ne sw 9-4n-14w	150	1476
Peters 2, se sw nw 9-4n-14w	110	1477
Lang & Lewis, Flesser 3, nw ne sw 15-4n-13w	85	1592

Arenac County—

Don Rayburn, Kerr 1, sw ne ne 22-19n-3e	1400	2870

Bay County—

L. C. MacGregor, Kircher 1, sw sw ne 2-14n-4e	112	2850

Montcalm County—

Belvidere Oil Co., Bradley 1, se nw ne 20-12n-7w	¶1.75	1307
Dickinson 1, se nw nw 14-12n-6w	¶1.75	1254

Oceana County—

C. W. Teater, Skidmore 1, se se nw 4-16n-16w	*	2385

Ottawa County—

C. E. Bliss, Merkins 1 sw nw nw 21-8n-15w	*	2170

Roscommon County—

Wracco Syndicate, Fee 1, ne nw nw 14-21n-4w	*	4008

Van Buren County—

Kigus & Kelley, Wright 1, ne sw ne 17-2s-15w	*	1102
Brown, Down & Kuhns, Banks 1, se se se 11-1s-14w	*	1288

Mississippi

Attala County (Wildcat)—

Hawkins, Howell & Matthews, Weeks 1, 29-15n-6e	*	5022

Newton County (Wildcat)—

Kingwood Oil Co., State 1, 27-8n-10e	*	4781

Yazoo County (Tinsley Dome)—

Union Producing Co., Robinette Est. 2, 19-10n-3w	400	4935
Partridge 3, 1-10n-3w	250	5291

Missouri

Livingston County—

Chillicothe Syndicate, Linton 1, cw½ se 15-56n-23w	*	1213

New Mexico

Eddy County—

R. J. Johnston et al, Harbold 1, nw ne se 26-17s-27e	*	555
O. H. Randell et al, Gates 1 nec se 22-18s-30e	12	3392

Lea County (Vacuum)—

Great Western Producers, State 1-E, nw sw nw 25-17s-35e	696	4555
Texas Co., State 3-Z, c se nw 2-18s-34e	680	4710

*Failures; †Junked; ¶Million cu. ft. gas.

United States Well Completions—*Continued*

Nebraska

Nemaha County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Sonken-Galamba et al, Lehr 1, cse se 25-5n-14e	*	1357

New York

Allegany County—

Company, Well and Location	Init. Prod. Bbls.	Depth
LeMont Oil Co., Pierce farm, Wirt.	6	1239
R. B. Moore No. 6, Daniels farm, Bolivar	4	1426
Bradley Prod. Corp., Monder farm, Alma	5	1288
V. V. V. Franchot, Reddy farm, Alma	8	1434
Scio O. & G. Co., Fuller farm, Scio	4	763
H. W. Patterson, Black farm, Scio.	4	763
Sloan & Zook, McDivitt farm	4	1324
Messer Oil Corp., Koehler farm, Genesee	5	1379
Carter & Streeter, Davidson farm, Wirt	5	1383
Water Intake Wells—		
Messer Oil Company, Shaner farm, Bolivar	..	1442
Porge Oil Co., Anderson farm, Alma	..	1349
Ebenezer Oil Co., Norton farm, Bolivar	..	1578
Dick Oil Co., Cameron farm, Bolivar	..	1419
L. H. Thornton et al, Fassett farm, Willing	..	1170
Bohne Bros., Materna farm, Wellsville	..	1382
H. W. Patterson, Fuller farm, Scio.	..	738

Oklahoma

Caddo County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Magnolia, Gingrich 1, se nw nw 6-5n-9w (OTD 2385)	10	3362
Rollins, Rigney 1-A, swc nw 12-5n-9w	¶19.6	4616
Carter County—		
Batson, Williams 4, nw ne sw ne 20-4s-2w	216	2047
Gibson et al, Lamb 1, nw ne ne 29-4s-2w (OTD 2294)	16	2315
Lamb et al, Fee 1, ne nw ne 29-4s-2w	20	2324
Creek County—		
Sinclair Prairie, Kieffer 33, se sw nw se 17-17n-12e	30	1532
Grady County—		
Ray, Kearns 1, ne ne sw se 21-3n-5w	10	2375
McCasland, Kilgore 1, sw sw nw nw 27-3n-5w	8	1720
Hughes County—		
Delaney, Warren 1-A, ne se nw 29-7n-8e	*	3210
Okfuskee County—		
Phillips, Replogle 1, sw se 2-11n-10e	92	3191
Smith, Robinson 1-A, se 26-11n-11e.	¶2.0	2471
Okmulgee County—		
Hazlett, Ashley 11, sw nw 29-14n-14e	10	1270
Osage County—		
Martin et al, Osage 1, se se ne 32-20n-12e	*	2121
Norris, 13, se sw se sw 15-21n-12e..	5	1327
Pontotoc County—		
Thompson Bros., Haney 1, ne sw nw 2-1n-7e	*	1950
Hall et al, Summers 4, nw sw se 26-5n-4e	40	2611
Pine, Jeeter 3, ne se sw 26-5n-4e..	39	2538
Pottawatomie County—		
Townsend et al, Lynn 1, nw ne nw 28-6n-4e	*	3925
Sinclair Prairie, Gilbreath 3, sw se se 25-7n-4e (OTD 4286)	*	3150
Seminole County—		
Magnolia, Fleet-Osborn 1, nw se ne 26-5n-7e (OTD 3905)	90	3989
Newsom, Oakes "B" 1, sec sw 16-7n-6e	*	4416
Stephens County—		
Central O. & G. Dr. et al, Graham 2, sw swc ne 12-1n-5w (TD 6046)	28	5760
Tulsa County—		
Parks Dr. Co., et al, Nat'l Bank 1, nec sw 35-20n-13e	5	1050
King, Samuels 3, nw ne 35-17n-12e	¶5.0	1332

Pennsylvania

BRADFORD DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Bell Oil Co., Fee	2	....
Ryder Scott Co., Fee	3	....
South Penn Oil Co., Rumsey	1	....
Bradford Tr. Co., 28 wells	28	....
Forest Oil Corp	1	....
Forest Pet. Corp	1	....
Niagara Oil Corp., 3 wells	3	....
John H. and Shirley D. Sloan, Bing 413	2	....
George Van Vechten and Son, Tarr.	1	....
Pine Run Oil Co., Bing 130-1-2-3-4-6	4	....
Penn Valley Crude Oil Corp., Fee..	1	....
D. E. Quinlan Estate, Fee	2	....
Smith Estate, Fee	2	....
Water Intake Wells—		
Forest Oil Corp., 2 wells	.	....
Forest Pet. Corp., 2 wells	.	....
Niagara Oil Corp., 4 wells	.	....
N. V. V. Franchot, Mgn. Tr., Campbell	.	....

BUTLER ARMSTRONG DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Larkin Rapp et al, Sasse Hrs.	½	....
Peoples Nat. Gas Co., Bell Hrs.	¶	....

MIDDLE DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Crowther Bros., Rossman	½	....
H. M. Amsler, Bissell or Wick	1	....
C. S. Ehret, Stull	1	....
Joseph Karl et al, Lot 106	3	....
White Mitchell, Cleon Heald	¶	....

NEW YORK-PENN GAS FIELD

Company, Well and Location	Init. Prod. Bbls.	Depth
Empire Gas & Fuel Corp., Atwood	¶	....

East Texas

Joiner Area—

Company, Well and Location	Init. Prod. Bbls.	Depth
Roosth & Genecov Prod. Co., Curbo 10 (120-ac)	55	3658
Wolford 1 (59/100-ac)	1200	3739
Kilgore Area—		
R. C. Brantley et al, Camp 3-B	40	3564
Gross & Shulman, Walker-Sun 3 (40-ac)	720	3739
Alex Ryan et al, Spear 3 (82/100-ac)	1200	3573
Shell, Willoughby 29 (57.7-ac)	5000	3625
Longview Area—		
Deep Rock, Jones 27 (61.12-ac)	6000	3585
Magnolia, White 29 (80-ac)	4000	3520
Stewart Oil Co., Killingsworth 4 (69.9-ac)	72	3605
Anderson County (Cayuga)—		
W. F. Morgan et al, Royal-Cone 1 (100-ac)	30	4039
Franklin County (Talco)—		
Humble, Dawson 12 (80.45-ac)	400	4290
Penn-Humble 22 (700-ac)	660	4287
Freestone County (Long Lake)—		
Hunt Oil Co., Dietz 1 (665-ac).	¶80.0 & 26	5267
Navarro County (Wildcats)—		
A. J. Willis et al, Cheney Est. 1	*	828
Swanson 1	*	875
Robertson County (Wildcat)—		
Rhet Wilder et al, Cerf 1	*	1611
Titus County (Talco)—		
Lucey Pet. Co., Williams 19 (319.85-ac)	233	4290
Harrison County (Wildcat)—		
J. A. Hughes, Taylor 1, McNutt sur	2	2612
Shelby County (Joaquin)—		
Paul Pewitt et al, Swan 1, Ann Gray sur	*	5125

North Texas

Archer County (Hull Silk)—

Company, Well and Location	Init. Prod. Bbls.	Depth
Ed. Cox & Hamon, Nichols 2	624	4416
Humble, Wilson 10	888	3786
Pet. Producers Co., Anderson 1-C.	1248	4420
Archer County—		
Bridwell Oil Co.-Texas Co., Oil Inv. Co. 4	*	1475
L. T. Burns et al, White 102	*	900
Panhandle Ref. Co., Green 11-C..	76	1129
White & Duncan, Webb 10-B (water input)	*	725
Webb 11-B (water input)	*	707
Clay County—		
T. A. Norwood et al, Taylor 11	10	1141
Sussex Oil Corp., Glasgow 13	10	1100
Clay County (Wildcat)—		
Jones-Associated Oil Co.-Roberts & Lynch, Edwards 1	*	6234
Cooke County (Walnut Bend)—		
Sinclair Prairie, Atkins 1	605	4991
Montague County (Bonita)—		
Sinclair Prairie, Lee 2	1784	5456
Montague County (Benton-Holmes)—		
United Prod. Co.-Conoco, Braman 3	*	3979
Montague County (Wildcat)—		
A. R. Dillard-E. C. Norwood, Holland 1	*	5991
Montague County (Ringgold)—		
W. B. Omohundro et al, Seay 3	1068	5717
Wichita County (K-M-A)—		
Continental, Waggoner Bros. 7-B..	512	3795
Hammon, Hanlon & Buchanan, Fassett-Tuttle 27	688	3970
Hanlon & Buchanan, Fassett-Tuttle 11-G	256	4049
Shell & Phillips Pet, Griffin 11	1338	3813
Wichita County—		
C. E. Beavers et al, Perkins 3	*	1454
Wichita County (Wildcat)—		
Panhandle Ref. Co., Waggoner Est. 1	*	742
Wilbarger County—		
Paradise Oil Co., Waggoner Est. 8-B	36	1564
Young County—		
Henry Craig et al, Cooper-Siebold 1	*	1229
E. W. Hunt et al, Gass 8	*	1246
L. A. Long et al, Stovall 1-B	¶3.5	2480
N. H. Martin & Son, Hamilton 3-C.	9	886
E. W. Robitaille et al, Vaughn 6-A.	528	4068
A. T. Strong et al, Fitzgerald 1	*	4313
E. D. Willis et al, Stewart 9-B	*	856
Wilson & Webb, Robinson 2	*	568
Henry Zweifel et al, Pistole 2	1113	3980

Texas Gulf Coast

Alta Loma—

Company, Well and Location	Init. Prod. Bbls.	Depth
Stanolind, Hulen 2	1214	1117
Anahuac—		
Gulf, Knowles 12	498	7096
Humble, Tyrell 32	648	7080
Clam Lake—		
Shell, McFaddin 10	121	5942
Dickinson—		
Humble, Maco Stewart 4-A (wo)	430	8660
Pure, Maco Stewart 7	313	8321
Fannett—		
Gulf, Junker 5	10	5668
Hillje—		
Texas, Orsak 1	88	5240
Bowles, Koenig 1	52	5240
Hull—		
Campbell, Crown Central 1-A	429	3070
Quinn, Abel 15-A	45	993
Lovell's Lake—		
Shell, Nelson 4	148	7809
Magnet—		
Humble, Cockburn 27	110	5544
Martha—		
Stanolind, Seaberg 3	30	8188
Old Ocean—		
Stanolind, Chenault-Smith 1	275	10,780
Racoon Bend—		
Humble, Hardy Y-7	*	7503
Segno—		
Gulf, Wing 38	551	8123
South China—		
Pan-American, Fontenot 3	9	7876
Tomball—		
Humble, Martens 3	315	5564
West Columbia—		
Texas, Phillips 16	510	5660
Withers—		
Texas, Pierce C-79	125	5383
Pierce C-80	118	5375
Chambers County—		
Humble, State B-1-288	*	9573
State C-1-45	*	9300

ACIDIZING HAND BOOK

By BENSON M. KINGSTON

A timely, thoroughly practical book on a most important subject

Acidizing Hand Book takes up the purpose of acidizing, gives full information on formations which are treatable, tells how to determine treatability of formations, how to prepare a well for acidizing, and contains a section of tables extremely valuable to an operator planning to acidize a well.

The book is divided into 14 chapters which include:

Chemistry and Geology of Treatment—Treatment Acid—Preparation of Wells for Treatment—Mechanics of Treatment (4 chapters)—The Reaction of Salt Water to Treatment—Producing the Well After Treatment—Acidizing Gas Wells—Re-treatment and Multiple Stage Treatment—Other Uses of Muriatic Acid in the Field, and Computations in Acidizing.

The author has had many years of experience in practical work acidizing wells.

The Acidizing Hand Book has a Fabrikoid binding, size 5¼ x 8 inches, and contains 78 pages.

PRICE $1.50, POSTAGE PREPAID

Address Book Department

Gulf Publishing Co., Houston, Texas

United States Well Completions—*Continued*

West Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Crane County (Jordan)—		
Snowden-McSweeney Co., University 8, sec 13	518	3567
Crane County (Sand Hills)—		
Gulf, Waddell 13	277¶	4585
Humble, Tubb 42	2743	4400
Crockett County (Soma-Noelke)—		
Henry Schooler et al, Noelke 1 (pb to 1050 ft)	¶2.0	1530
Ector County (Foster)—		
Great Western Producers, Inc., Johnson 8	1422	4182
Humble, Henderson 4-B	933	4197
Stanolind, Johnson 19	59	4220
Witcher 46	1198	4100
Ector County (Goldsmith)—		
Oil Well Dr. Co., Cummins 2-D	246	4231
Ector County (Jordan)—		
Atlantic Ref. Co., University 8-B	782	3655
Ector County (North Cowden)—		
M. J. Delaney et al, Smith-T. P. Coal 1-B	1297	4440
Tide Water, T. P. Land Trust 1-A	1760	4190
Gaines County (Seminole)—		
Harry Bass et al, Austin-Standard 2	429	5231
Magnolia-Atlantic, H. & J. 11-219	789	5261
H. & J. 3-251	682	5311
Ohio Oil, Trippett 3	765	5268
Osage Dr. Co., Brand-Humble 2 (pb to 5255 ft)	130	5307
Gaines County (Wasson)—		
Amon Carter et al, Wasson 6-D	1336	5040
Hockley County (Slaughter)—		
Magnolia, Mallet L&C Co., 1-D	734	4990
Mitchell County (Northwest)—		
J. E. Ewing et al, Strain 1	152	1700
Winkler County (Keystone)—		
Gulf, Keystone 38	348	3407
Ralph Lowe et al, Campbell-Texaco 2	429	3302
Yoakum County (Wasson)—		
Aloco Oil Co., Willard-Texaco 10-A	1264	5214
Basin States Oil Co., Fisher-Walker 2	486	5198
Oil Dev. Co., Willard 2-38	1309	5085
Shell, Baumgart 14-D	1524	5170

West Central Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Brown County—		
Elmore Oil Corp., Triplett 1	15	1350
Kynaston & Grossell, Byrd 1	*	1410
Coleman County—		
Bradford & Robertson, Gillespie 3	57	3577
Harper & Knappenberger, White 1	*	3635
State Oil Corp., Coker 3	151	3597
Jones County—		
Dean Bros. et al, Carlton 1 (240-ac)	*	3501
J. C. Hunter & Iron Mt. Oil Co., Strand 1	25	3428
Petroleum Prod. Co., Bryant-Link 3	150	1870
Shackelford County—		
Fox & Rudd, Shotwell 3	51	1631
J. P. Ray et al, Ghio 1	10	600
Roeser-Pendleton, Cook 18-B-113	*	1675

Texas Panhandle

Company, Well and Location	Init. Prod. Bbls.	Depth
Carson County—		
Cities Service, Magnolia 7-E	42	3122
Texas Co., Quinn 15	20	3130
Texoma Nat. G. Co., Schafer 8-S	¶22.3	2620
Hutchinson County—		
Clay Bros. Dr. Co., Carver 1-B	85	3245
J. M. Huber Pet. Corp. Weatherly 8	742	3091
Power Pet. Co., Haile 1-B	258	3067
Stanolind, Watkins 16-B	298	2914
Texas Co., Lewis 32	20	2980
Moore County—		
Canadian River Gas Co., Thompson 3-B	¶73.5	3117

South Texas

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Bee County—		
Laura "C" Oil Co., Ablinger 1 (Beeville) new sd, John Ryan sur	¶5.0	6013
Brooks County—		
Humble, McGill Bros., 70 (Kelsey)	300	4738
Hidalgo County—		
Phillips Pet., Flores 4 (Samfordyce)	350	4192
Jackson County—		
C. G. Glasscock, Walker 1 (WC) 1 mi sw Lolita fld	*	6546
Magnolia, West 85-A (West Ranch)	500	6758
West 101-A (West Ranch)	1100	5126
Jim Wells County—		
Atlantic Ref., Mueller 2 (Wade City)	400	4930
H. H. Howell et al, Wolters 1 (Orange Grove)	650	5151
H. H. Howell & E. C. Hubble, Engleking 1 (Premont)	20	2370
Nueces County—		
Gulf Plains Corp., W. S. Sellers - (Stratton)	¶50.0 &	6586
Phillips Pet., Crystal-Gandy 1 (Clara Driscoll)	11	5948
Wellington Oil Co. of De a, Richardson 7 (S. Clara Driscoll)	160	5740
San Patricio County—		
T. N. Davey, Hutto 1 (WC) Sec. 81	*	6047
Manahan Oil Co., Carlock 7 (McCampbell)	200	6821
Texas Atlas Oil Co., Conn Brown 1 (DD 37) (McCampbell)	75	7525
Victoria County—		
Barnsdall, Marberry 2 (McFaddin)	175	4419
Stanolind, Vandeberg & Hill 7 (East Placedo)	500	6885

LAREDO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Duval County:		
J. L. Collins & Co., Adami 1 (WC) sur 47	*	1357
Government Wells Oil Co., Lundell 44 (Lundell)	200	1554
Scheig Bros. & Adelon, Martin 3 (Casa Blanca)	29	1132
Jim Hogg County—		
Guy A. Davis et al, Reuben Holbein 1 (WC) sec 4	250	3150
Zachry 1 (Manila)	500	2600
V. F. Neuhaus, Martinez (Trevino) G-3 (Colorado)	500	2918
McMullen County—		
C. C. Shumway & C. H. Burns, Shiner Ranch 8 (WC) sec 1-A	*	1478
Starr County—		
W. R. Davis, Davenport 6-A (Rincon)	350	4230
Webb County:		
Magnolia, Benavides 11 (West Co'e)	22	2361
Tide Water, Bruni 8 (WC) sec 7	*	10,295
Transwestern Oil Co., A. M. Bruni Est. 11 (Glen)	¶10.0	2156

SAN ANTONIO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Medina County:		
J. A. Tarver, G. P. Oakes & Wm. Shireman, Lindeburg 1 (WC) sur 389	*	1010

Come to

New Orleans

This Winter

THERE is one way that your stay here will be pleasant: Stop at The Roosevelt. A hotel that exemplifies Southern Hospitality. The type of hospitality that matches perfectly the demand and moods of every guest.

800 Rooms with Bath.

Moderate Rates.

GEORGE V. RILEY, V. P. and Gen. Mgr.

The Roosevelt

Hotel

WILDCAT REPORT
New Starts and Completions

ARKANSAS

FIRST REPORT

Arkansas County—Jay Oil Co.'s Trice 1, cne sw 16-2s-3w, mat.

CALIFORNIA

FIRST REPORT

San Bernardino County—George Kipp, Inc.'s Bannon 1, 32-2-8; dr 872, Carbon Canyon area.

COMPLETIONS

Kern County—Cresmont Oil Co.'s Smith 1, 11-26-27; Vedder 2480 ft; abnd 2504 ft, Mt. Poso area.

Orange County—Security Land & Water Co.'s Security 1, 9-3-10, Repetto 3700 ft, abnd in hard siltstone, 5185 ft, La Habra area.

GEORGIA

FIRST REPORT

Truetlen County—Glenn D. Rose & H. L. Ray's Fowler 1, (unsectionized), 6 mi ne Soperton, rig for 5000-ft test.

KANSAS

FIRST REPORTS

Rice County—Carlock et al's Karber 1, cw½ nw nw 7-19-10w, dr.

Rooks County—Gulf et al's Bruton 1, cel se ne 23-8-17w, dr.

Saline County—Crown et al's Lacquemont 1, cel se sw 30-16-1w, pits.

COMPLETIONS

Butler County—Grallon et al's Wilhite 1, nec sw 16-27-7e, 2 mi e Knox pool, Mississippi 2714 ft, abnd 2730 ft.

Greenwood County—Allison et al's Short 1, nec 10-24-11e, 2 mi s Seeley-Wick pool, Bartlesville 1793-1802 ft, Mississippi 1927 ft, abnd 1956 ft.

Cowley County—Wixon et al's Clover Ranch 1, cw½ e½ 17-31-7e, 4 mi w Brown pool, disc. Mississippi 2783 ft, td 2812 ft, 2000 gals acid, 35 bbls.

Barton County—Skelly's Esfield 2, cn½ se se ne 30-16-11w, new horizon in Krier pool. Topeka 2665 ft, td 2877¼ ft, perf csg 2870-75 ft, 2000 gals acid, 1251 bbls.

NORTH LOUISIANA

FIRST REPORT

Winn Parish—Atlantic Ref. Co's L. & A. Oil Co 1, se 29-9n-2w, mat.

COMPLETION

Caddo Parish—R. W. Crosby's Glassell 1, sw ne 11-19n-15w, abnd 2800 ft.

SOUTH LOUISIANA

FIRST REPORTS

Acadia Parish—Humble's Freeland 1, sec 27-10s-1e 1 mi s Leger 1, disc South Crowley fld, lcn for 8500- or 9000-ft test.

Cameron Parish—Superior's State-Lake Calcasieu 4, Lake Calcasieu salt dome, sec 1-14s-9w, 660 ft ne State 3, recent 13,579-ft abandonment, lcn deep test. Danciger's Mallard Bay Ld. Co 1, 6 mi se Grand Lake fld, sec 23-13s-3w, lcn.

Evangeline Parish—W. B. Hamilton's Amy 1, 3 mi e Eunice, sec 39-6s-1e, laying gas lines for 8000-ft test.

Assumption Parish—Humble's Michie 1, East Labadieville area, 1 mi nw Humble's Sugars 1, 12 600-ft dry hole, sec 108-14s-15e, lcn deep test.

COMPLETION

Cameron Parish—Superior's State-Lake Calcasieu 3, Lake Calcasieu salt dome, deepest test ever drilled in Louisiana, side-wall samples 9450-60 ft and 9485-95 ft rec gas odor and oil cut, test rec sw abnd 13,579 ft.

MICHIGAN

FIRST REPORTS

Barry County—Wolverine Nat. Gas Co.'s Neynolds 1, s½ se nw 25-1n-8w, rig.

Clare County—American Dr. Co.'s Cornwell 1, c s½ sw sw, 8-18n-3w, rig.

Lenawee County—Voorhees Dr. Co.'s Gillen 1, n½ 12-9s-1e, dr.

COMPLETIONS

Allegan County—H. C. Nelson's Balch 1, se se se 7-2n-15w, Traverse 1273 ft, abnd 1292 ft.

Oceana County—C. W. Teater's Skidmore 1, se se nw 4-16n-16w, Traverse 2289 ft, abnd 2385 ft.

Ottawa County—C. E. Bliss, Merkins 1, sw nw nw 21-8n-15w, Trv. 1775 ft, abnd 2170 ft.

Roscommon County—Wracco Syndicate's Fee 1, ne nw nw 14-21n-4w, Dundee 3924 ft, abnd 4008 ft.

Van Buren County—Kilgus & Kelly's Wright 1, ne sw se 17-2s-15w, Trv. 1088 ft, abnd 1102 ft.

MISSISSIPPI

FIRST REPORT

Grenada County—James Papadakis' Holcomb 1, sec 13-22n-2e, mat. H. T. Salter et al's Carpenter 1, sec 6-21n-7e, mat.

COMPLETIONS

Attala County—Hawkins, Howell & Matthews' Weeks 1, nw sw 29-15n-6e, chalk 2407 ft, Tuscaloosa (Woodbine) 3511 ft, abnd 5022 ft, Tuscaloosa.

Newton County—Kingwood Oil Co.'s State 1, ne ne se 27-8n-10e, abnd 4781 ft.

MISSOURI

FIRST REPORTS

Holt County—Flory & Kilby et al's Meyer 1, swc 22-62n-39w, rig.

Livingston County—Jones et al's Kesler 1, se nw 16-59n-25w, dr.

COMPLETION

Livingston County—Chillicothe Syndicate et al's Linton 1, ne sw se 15-56n-23w, 9 mi se Chillicothe, Arbuckle 1140 ft, no show, abnd 1213 ft.

NEBRASKA

FIRST REPORTS

Furnass County—Trickett et al's Gossic 1, nwc 33-2n-21w, mim.

Nemaha County—Black Gold Operating Co.'s Allen 1, cse sw 16-4n-15e, rur.

Thurston County—Skriver et al's Armour 1, nec 33-28n-8e, Arbuckle 1200 ft, ur 5-in, 1300 ft.

COMPLETION

Nemaha County—Sonken-Galamba et al's Lehr 1, cse se 25-5n-14e, se Auburn, lost hole, abnd 1357 ft.

NEW MEXICO

COMPLETION

Chaves County—E. J. Fisher et al's Hill 1, ne nw sw 8-15s-25e, elev 3568 ft, (dd from 850 ft) hfw 880-905 ft, abnd 968 ft.

OKLAHOMA

FIRST REPORTS

Hughes County—Magnolia et al's McKay 1, swc se 16-5n-11e, mim.

Kay County—I. T. I. O. Co. et al's Goodson 1, swc ne 13-28n-3e, dr.

Lincoln County—Berkey et al's Hoffman 1, sec 18-12n-6e, dr. Berkey et al's Tedford 1, nec nw 28-12n-6e, rig.

Pontotoc County—North American et al's Mount 1, se sw nw 13-4n-6e, dr. North American et al's Mayer 1, ne nw ne 20-4n-7e, dr.

COMPLETIONS

Creek County—Indo Oil Co.'s Slick 1, nwc 1-16n-9e, N. Bristow dist, Dutcher 2919-21 ft, Layton 1145-78 ft, shot 80 qts 1145-78 ft, abnd 1375 ft.

Lincoln County—Wilcox et al's Murphy 1, ne se sw 7-14n-6e, between Sac & Fox and Davenport pools, Prue 3206 ft, td 3268 ft, shot 200 qts, 3200-68 ft, 8 bbls.

Okfuskee County—Graham et al's McLain 1, se sw sw 7-12n-7e, 1½ mi nw Paden pool, Prue 2949 ft, abnd 2960 ft.

Payne County—Wood et al's Krolop 1, swc se 14-17n-5e, 3 mi e Cushing, Layton 2230-69 ft, Wheeler 3030-52 ft, lime 3540-42 ft, abnd 3574 ft.

Stephens County—Grimes et al's Baker 1-A, se nw nw 35-2s-6w, 1½ mi s Woolsey pool, sd 1101-24, abnd 1418 ft. Arrow Dr. Co. et al's Stallings 1, swc 18-3s-4w, between Dixie and Loco pools, abnd 1248 ft.

SOUTH TEXAS

FIRST REPORTS

Duval County—Adolph Dovre's Worden & Drought 1, 320-ac tr covering w½ Sec 157, CCSD&RGNG sur, 20 mi nw Freer, lcn. Gilcrease Oil Co.'s Weil 1, 640-ac tr, Manuel & Rogers sur 568, 10 mi s Freer, 2½ mi sw Saranosa, lcn.

Goliad County—Renwar Oil Corp.'s Swickhiemer 1, lot 29, Swickhiemer subd, Cuardrilla Irr. Co. sur 316, 3.3 mi se Fannin, lcn.

Jackson County—Wynn Crosby Dr. Co.'s Four Way Ranch Co. 1, lot 199, Young-Coleman sur ab 15, 3 mi ne LaWard, lcn.

Jim Hogg County—Texas Co.'s Armstrong 2, A. Villa sur 90 ab 333, Gutierrez area, lcn.

Medina County—Cruseturner Oil Co.'s Wiemer's 1, 325-ac tr, J. Bader sur 51, blk 16, 9 mi se Hondo, lcn.

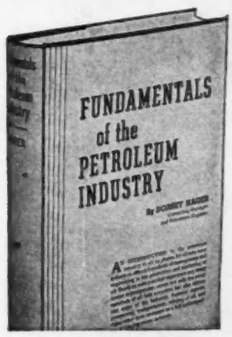
Starr County—W. R. Davis' Seyfriedt et al 1, 60-ac lse, sur 928, 25 mi ne Rio Grande City, lcn.

Victoria County—Humble's Nave 2, 1451-ac lse, Maria J. Traviesa gr, East McFaddin area, 5 mi sw Bloomington, sp. Titanic Oil Co.'s Edwards 3, Deternal area, contracted by George Echols, skid on.

Webb County—O. W. Killam's Bruni 1,

√Check Your Methods of Engineering, Operation, and Management in the Oil Industry

against this helpful book of oil industry facts and data



445 pages,
133 illustrations,
$3.50

Fundamentals of the Petroleum Industry

By DORSEY HAGER

Here is one man's contribution to the industry in which he has spent a lifetime—a complete, clear-cut manual of dependable facts and methods. Everything is covered, from history and statistics of the industry to a survey of future trends. How oil occurs, how it is discovered, how oil lands are acquired, are discussed, with suggestions on technical and business practices. Over 150 pages are devoted to a description of drilling problems and latest equipment and methods for meeting them.

Send Orders to

The Gulf Publishing Company

P. O. Box 2608, Houston, Texas

YOUR GRACIOUS HOST
FROM COAST TO COAST

A.S. KIRKEBY, *Managing Director*

KIRKEBY HOTELS

160-ac blk 3, George Brown subd, Albercas gr, 12 mi se Mirando, lcn. Jay Simmons' Moglia 1, sur 670, 547.3-ac lse, 9½ mi n Bruni, lcn.

Zapata County—Jose Martinez and J. M. Salinas' Bruni 2, blk 43, subd of Blas Uribe tr B-8, J. V. Borrego gr, 13 mi s Aguilares, lcn. E. A. Thompson et al's Quinlan 1, sh 4, por 19, Lopeno area, sp, contracted by Howard Staggs.

COMPLETIONS

Bee County—Laura C. Oil Co.'s Ablinger 1, 109.65-ac tr, John Ryan ab 63, 200 ft se Glasscock's Ablinger 1, 3½ mi se Beeville, td 6013 ft, gas & dist. prod, 1800/1800, perf 4375 ft, new sand in Beeville fld.

Duval County—J. L. Collins & Co.'s Heirs of Chas. Adami 1, A. & B. sur 47, e Adami fld, 20 mi nw Freer, abnd 1357 ft.

Jackson County—C. G. Glasscock's Walker 1, 50-ac lse, George H. Ewing league, ab 20, 1 mi sw fld, abnd 6546 ft.

McMullin County—C. C. Shumway & Charles H. Burns' Shiner 8, s½ sec 1-A, C. C. Shumway subd, Shiner ranch, Thomas Flugham sur, ab 202, blk 1-ACCC, 12 mi se Tilden, 1 mi s Ezell fld, abnd 1478 ft.

Medina County—J. A. Tarver, G. P. Oakes & William H. Shireman's Lindeburg 1, 189-ac lse, Joseph Christilles sur 389, 2 mi n Dunlay, abnd 1010 ft.

San Patricio County—T. N. Davey's Hutto 1, 80-ac tr, sec 81, George H. Paul's subd of Coleman-Fulton Pasture Co.'s lands, sw Palm Meadow's Coggin 1, 3 mi se Taft and w prod at Midway, abnd 6047.

Webb County—Tide Water's Bruni 8, Cole-Bruni area, sec 7, Foltz subd, Mariano Arispe gr, abnd 10,295 ft.

Jim Hogg County—Guy A. Davis et al's Holbein 1, sec 4, blk 35, Holbein subd, 2000-ac blk, 3 mi e Henne, Winch & Fariss fld, 15 mi sw Hebbronville, Manila 2795 ft, td 3150 ft, est 85 BPD, flow valves, light pressures, perf 2795-2811 ft, 26-gr, new sd.

NORTH TEXAS

FIRST REPORTS

Clay County—W. H. Metzner et al's Boddy 1, blk 50, Bacon subd, spd on 3000-ft test.

Montague County—J. G. Hammond, Inc.'s Jester 1, 84½-ac lse, E. Wingate sur A-835, 2 mi w Mallard, rur 6500-ft test.

Wichita County—W. W. Chambers-Simmons & Norwood's Chenault 1, blk 78, Red River V. L. subd of I&GN sur A-568, dr 2110 ft on 4500-ft test. Bert Lignon & Morrison's Mueller 1, sec Red River V. L. subd blk 50, dr 1415 ft. Jack Story Jr. et al's Hefley 1, BBB&C sec 2, A-466, lcn 1600-ft test.

Young County—Home Oil Co.'s Rothell 1, nec TE&L sec 217, lcn.

COMPLETIONS

Clay County—Jones Associated Oil Co-Roberts & Lynch's Edwards 1, blk 40, Madison CSL sur, Bend 5929 ft, Ellenburger 6077 ft, abnd 6234 ft. W. B. Omohundro et al (was Youngblood-Foree et al's) Wynn 1, nw sec 2, G. Gowan sur A-795, (dd from 6070 ft) Simpson 6546 ft, abnd 6654 ft.

Montague County—A. R. Dillard-E. C. Norwood's Holland 1, swc M. Montalba sur A-497, first Bend conglomerate 5283-85 ft, abnd 5991 ft.

Wichita County—Panhandle Ref. Co.'s Waggoner Est. 1, A. Gibson sur A-455, abnd 742 ft.

WEST TEXAS

FIRST REPORTS

Cochran County—Ray Rhodes & Atlantic Ref. Co.'s Dean-Slaughter 1, cne¼ Tr. 4, League 89, Lipscomb csl sur, mim.

Hockley County—Cascade Pet. Co.'s Walker 1, lab 22, league 22, McCulloch csl sur, rur.

Loving County—H. C. McCauley et al's Hall 1, s corner W&NW sec 60 blk 1, 3 mi e Wheat field, lcn.

Sutton County—S. B. Roberts et al's Allison 1, c nw ne GH&SA sec 44, blk K, lcn 4700-ft test.

EAST TEXAS

COMPLETION

Harrison County—J. A. Hughes' Taylor 1 McNutt sur, Tokio 2429-91 ft, pumped two bbls oil day from Tokio, td 2612 ft.

TEXAS GULF COAST

FIRST REPORT

Waller County—H. E. Williams' Harris 1, 6 mi nw Katy fld, McCutcheon sur, lcn for 7500-ft test.

COMPLETION

Chambers County—Humble's State B-1, tract 288, Galveston Bay, abnd 9573 ft; State C-1, tract 45, Fishers Reef prospect, abnd 9300 ft.

WEST CENTRAL TEXAS

FIRST REPORT

Taylor County—Ken B. Nowels et al's Hardin-Simmons University 1, sec nw L.A.L. sec 36, 9½ mi se Abilene, lcn.

EAST TEXAS

COMPLETIONS

Navarro County—A. J. Willis et al's Cheney Est. 1, elev 329 ft, Nacatoch 727 ft, abnd 828 ft; M. B. Swanson 1, swc 40-ac tr, S. Johnson sur, elev 344 ft, Nacatoch 822 ft, abnd 875 ft.

Robertson County—Rhet Wilder et al's Moise Cerf 1, J. Erwin sur, 7 mi s Franklin, elev 469 ft, Carrizo 541 ft, Wilcox between 740-80 ft, abnd in Wilcox 1611 ft.

William M. Barret, Inc.
Consulting Geophysicists
Specializing in Magnetic Surveys
Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.
GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

THE FORT WORTH LABORATORIES
Analysis of oil field brines, cores, gas, oil, and minerals. Field gas testing. R. H. Fash, Vice-President; Long Distance 138. 828½ Monroe Street, Fort Worth, Texas.

HOUSTON LABORATORIES
Analytical and Consulting Chemist
Podbielniak Gas Analysis
Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils
Long Distance 267, Box 132, Houston, Texas

PATENTS
Patents, Trade Marks, Copyrights and Infringement Litigation
HARDWAY & CATHEY
428-29-30 Bankers Mortgage Bldg.
Phone Capitol 9756 Houston, Texas

The Firm of
JACK A. SCHLEY
ATTORNEYS AT LAW
PATENTS - INFRINGEMENTS - OPINIONS
1801-3 Commerce Bldg. — Houston
1807-11 Tower Petroleum Bldg. — Dallas
San Antonio — Washington, D. C.

Shilstone Testing Laboratory, Inc.
Chemical Analyses
Oil, Water, Gas, Etc.
Boiler Water Treatment
Physical Test & Inspection
Houston San Antonio New Orleans
30 Years Experience

GULF COAST LABORATORIES
3513 Agnes St., Corpus Christi, Texas
Phone 6422
Manufacturers of Boiler Water Treatment.
Core Analysis
Complete Laboratory Service
Sales Offices . . . San Antonio and Houston

FOR SALE
Ingersoll-Rand 4 X V G 2, Direct connected gas driven two stage compressor, 150 H.P. with all auxiliary equipment. Located in the East Texas field. Operated intermittently for fifteen months, excellent condition.
Merry Bros. & Perini, Inc.
Abilene, Texas

MEN IN THE INDUSTRY'S NEWS

W. A. PRUETT last week was named executive vice president of Superior Oil Company in one of several official changes and promotions necessitated by expansion of the company's business east of the Rocky Mountains. He will have charge of all operations of the company and will make his headquarters in Houston.

W. M. Keck, Jr., vice president formerly in charge of acquisitions of land, has been placed in charge of all land, development and producing operations. He will continue to make his headquarters in Los Angeles.

Howard B. Keck, vice president formerly in charge of development and producing operations from the Los Angeles office, is now directing land acquisitions and development and producing operations in the Gulf Coast, Mid-Continent and Mid-Western areas.

John C. Cody, field superintendent, is in charge of all development and producing operations in the Gulf Coast, Mid-Continent and Mid-West.

W. B. Warner has been named general counsel, and W. B. Jayred assistant general counsel.

J. R. BUTLER, formerly with The Ohio Oil Company, has been named manager for the Cotton Valley Operators' recycling project in the Cotton Valley field, Webster Parish, Louisiana.

An advisory committee for the operators consists of W. F. Dalton, Hunt Oil Company; Roy Davis, North American Oil Consolidated, Inc., and Howard Davenport, Woodley Petroleum Company.

John G. Huffman, engineer formerly with the Louisiana Conservation Commission, has been retained to draw plans for the high-pressure gathering and injection system field lines, for which separate contract will be awarded. Headquarters for the project have been opened in Hunt Oil Company's Shreveport office in the City Bank Building.

WILLIAM ASH WAID, chief inspector and oil engineer for the Osage Indian Agency, Pawhuska, Oklahoma, retired recently at the age of 65 after 25 years' service. Coming from the earliest of oil pioneers, his father entered the business by hauling oil in wooden barrels from Watsons' Flats in the vicinity of the Drake well to flat-boat on the Allegheny River, and later worked as a driller's helper. He was a charter member of the Bradford Oil Exchange. Waid drilled and operated small leases in West Virginia, Eastern Ohio and Pennsylvania from 1900 to 1915. While connected with the Agency, he had full charge of oil and gas field work, under the direction of the Indian superintendent and department regulations, and he arranged and listed practically all early day oil lease sales.

DANIEL F. FLEET, 57, Ada, Oklahoma, retired oil man and former official of the Fleetborn Oil Corporation, died October 2 in a hospital at Sherman, Texas.

JOHN R. EVANS, chief petroleum engineer for Stanolind Oil & Gas Company, Tulsa, was elected president of the Technical Club of Oklahoma at the initial banquet of the fiscal year on September 30 at the Tulsa Country Club. Evans succeeds H. W. Harts, Warren Petroleum Corporation. Other officers are Roy R. Bush, Pittsburgh Equitable Meter Company, vice president, succeeding J. N. McClure, The Elliott Company; C. F. Luckfield, Stanolind Pipe Line Company, re-elected secretary-treasurer.

A. H. RINEY, vice president of Phillips Petroleum Company, Bartlesville, has been named chairman of the nomination committee for the American Petroleum Institute's Division of Production. The committee will nominate members of the general committees of the division for 1941, to be elected during the institute's annual meeting in Chicago November 11-15.

Members of the committee are A. W. Ambrose, Cities Service Oil Company, Bartlesville; F. S. Bryant, Standard Oil Company of California, San Francisco; Roy E. Collom, Continental Oil Co., Los Angeles; F. E. Eckert, Hanley & Bird, Bradford, Pennsylvania; C. W. Froome, Union Oil Company of California, Santa Fe Springs, California; J. T. Hayward, Barnsdall Oil Company, Tulsa; E. P. Hubbard, Gulf Oil Corporation, Houston; H. W. Ladd, Stanolind Oil & Gas Company, Tulsa; H. N. Marsh, General Petroleum Corporation of California, Los Angeles; H. N. Pardee, The Texas Company, Tulsa; John G. Pew, Sun Oil Company, Dallas; J. J. Schmidt, The East Ohio Gas Company, Cleveland; C. R. Weidner, Sinclair Refining Company, Independence, Kansas, and J. H. Wood, Jr., The Atlantic Pipe Line Company, Dallas.

T. F. PALMER, land man for Sinclair Prairie Oil Company, has been transferred from Corpus Christi to Fort Worth to become chief clerk of the Texas division of the Sinclair Prairie Oil Marketing Company. He succeeds T. W. Everett, who goes to Corpus Christi as district land man.

LEROY R. PIERCE, 64, inventor of the Pierce spudder and pioneer driller, died September 30 at his home in Tulsa. A native of Pennsylvania, he came to Tulsa in 1930 and was active throughout the Mid-Continent area.

MORGAN DAVIS, Gulf Coast division geologist for Humble Oil & Refining Company, Houston, visited the company's West Texas-New Mexico district office at Midland early last week.

JOHN HUFF, JR., and Merle Bowsky, of Lane-Wells Company, discussed "Problems in Logging and Perforating in Deep Horizons" before the Houston Geological Society last week.

G. L. PARET, who some weeks ago resigned after six years with the land department of Stanolind Oil & Gas Company, is operating as an independent lease broker at Lake Charles, Louisiana.

M. G. McCOOL, for the past five years West Texas-New Mexico district manager for American Iron & Machine Works Company, Oklahoma City, has been named general sales manager. Before joining the company he was with Phillips Petroleum Company, and he also spent two years with Standard Oil Company of Venezuela in the purchasing and warehousing division.

L. D. Murray, Louisiana district sales manager, has been advanced to Gulf Coast district manager with headquarters in Houston. Before joining the company, he was with Haynes Drilling Company and Bovaird Supply Company.

Varney S. Harlin, in the engineering department of the company for the past six years, has been named chief engineer and head of the development and experimental department. He is a graduate of Oklahoma A. & M. College.

Harry E. Nelson, plant superintendent at Monahans, Texas, for the past five years, has been advanced to district manager of the West Texas and New Mexico territory.

B. E. Fox, purchasing agent and office manager at Oklahoma City, has been named district manager for Oklahoma, North Texas, Illionis, California and Wyoming, and has also been placed in charge of export sales.

R. E. Craine continues as district manager for Kansas.

F. M. WITTLINGER, secretary of Texas Electric Steel Casting Company, will present a talking motion picture prepared by the Steel Founders Society of America on "The Design of Steel Castings" before the Texas Chapter of the American Society of Metals October 10. The meeting, to be held at the River Oaks Country Club, Houston, will be open at 8 p. m. and be preceded by a dinner at 7.

Pictures taken at the group's spring barbecue by M. P. Laurent and Wade W. Hampton will also be shown, along with a talking motion picture prepared by E. I. du Pont de Nemours & Company on "A New World Through Chemistry."

J. C. MARTIN, district chief clerk at Angleton for Humble Oil & Refining Company, has been transferred to the Galveston Bay district.

R. L. JOHN, chief clerk in the Jacksonville district for Humble Oil & Refining Company, has been transferred to the Roanoke district, where he replaces A. D. Eady.

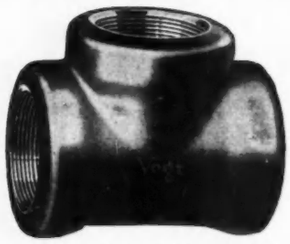
DR. W. L. RUSSELL, Lane Wells Company, spoke on "Well Logging and Radioactivity" before the Shawnee Geological Society recently.

JOSEPH KLEIN, foreman in the shops of Pittsburgh Equitable Meter Company, Pittsburgh, was honored at a luncheon recently on completion of 50 years of continuous service with the company.

GEORGE S. BUCHANAN, consulting geologist, last week was named president of the Houston Geological Society, succeeding Wallace Thompson, General Crude Oil Company. Buchanan was for-

MECO

FORGED STEEL FITTINGS



CROSSES, ELLS, TEES, UNIONS, BUSHINGS, PLUGS, COUPLINGS

SIZES: 1/8" to 6"
Pressures (Cold Working)
3000 and 6000 lbs.

—Quick Delivery from Large Houston Stocks!

MECO

MAINTENANCE
ENGINEERING CORPORATION
P. O. Box 2637 Phone P-3135
HOUSTON, TEXAS, U. S. A.

An A.A.P.G. Book (1939)

Recent
Marine Sediments

A SYMPOSIUM OF 34 PAPERS BY 31 AUTHORS

Edited by PARKER D. TRASK
U. S. Geological Survey, Washington, D. C.

Prepared under the Direction of a Sub-Committee of the Committee of Sedimentation of the Division of Geology and Geography of the National Research Council, Washington, D. C.

Carl W. Correns, Stina Gripenberg, W. C. Krumbein, Ph. H. Kuenen, Otto Pratje, Roger Revelle, F. P. Shepard, H. C. Stetson, Parker D. Trask, Chairman

This book is on the topic of Sedimentation and Environment of Deposition recently voted No. 1 in geological research of most importance to the progress of petroleum geology—in a poll of the 3,000 A.A.P.G. members and associates, conducted by the Research Committee. Throughout the book, the basic data — observational facts — are emphasized rather than speculative inferences.

- 736 pages; 139 figures
- Bibliographies of 1,000 titles; 72 pages of author, citation, and subject index
- Bound in blue cloth; gold stamped; paper jacket; 6 x 9 inches

PRICE: $5.00, POSTPAID

($4.00 to A.A.P.G. Members and Associate Members, Libraries and Colleges)

THE AMERICAN ASSOCIATION OF PETROLEUM GEOLOGISTS
Box 979, Tulsa, Okla., U. S. A.

G. S. Buchanan D. Gordon

merly associated with Barnsdall Oil Company and had been vice president of Adams Oil & Gas Company.

Other officers named were A. P. Allison, Sun Oil Company, vice president; Leslie Bowling, Union Oil Company of California, secretary; Dugald Gordon, of Brokaw, McKee & Dixon, treasurer, while J. W. Kisling, Jr., Amerada Petroleum Corporation, A. L. Selig, Stanolind Oil & Gas Company, and E. G. Thompson, Housh & Thompson, were elected to the advisory committee.

NORMAN C. CROSS, secretary and treasurer of Superior Oil Corporation, Tulsa, last week was named president of the Oklahoma Petroleum Accountants Society, succeeding R. B. Hansen.

Other officers named were B. E. Witchell, Phillips Petroleum Company, Bartlesville, first vice president; A. W. John, Tide Water Associated Oil Company, Tulsa, second vice president, and F. T. Anderson, Darby Petroleum Company, Tulsa, secretary-treasurer. New directors are J. B. Bass, Continental Oil Company, Ponca City; Virgil Marshall, Skelly Oil Company, Tulsa, and Anderson. Holdover directors are M. H. Massey, Stanolind Oil & Gas Company, Tulsa; L. E. Tustison, The Carter Oil Company; R. B. Hansen, and Cross, John and Witchell.

M. C. WILT has been appointed vice president and general manager of Curtis Lighting, Inc., 1123 West Jackson Boulevard, Chicago. G. T. Morrow has been named vice president in charge of sales; H. J. Dillon, vice president in charge of production, and L. N. West, secretary-treasurer.

C. K. STILLWAGON, president of Well Equipment Manufacturing Corporation, has returned to Houston from a tour through the north and east, including calls at Chicago; Midland, Michigan; Buffalo, Detroit, Boston, New York City and Pittsburgh. Accompanied by Mrs. Stillwagon, he met E. L. Oliver, North Texas district manager, in Chicago.

T. H. PIKE, JR., former California representative for The Guiberson Corporation, Dallas, has joined the sales staff of Tube-Turns, Inc., Louisville, Kentucky, as district manager in the West Coast territory. He will make his headquarters in Los Angeles.

K. R. TEIS, consulting engineer, last week discussed "Salt-Water Disposal Systems" before the Mid-Continent section of the American Institute of Mining & Metallurgical Engineers at Tulsa. P. E. Fitzgerald, Dowell Incorporated, presided.

Spindletop Pioneers to Build Monument to Lucas Gusher

In the oil business all wildcatters are pioneers that deserve credit and gratitude upon their success. There are, however, names that particularly stand out in our history. Drake conquered such obstacles as ridicule, lack of finances, and started the oil business with his discovery at Titusville, Pennsylvania, in 1859. In 1900, Captain Anthony F. Lucas had the conviction that Spindletop, a dome rising about 12 feet above the coastal prairie south of Beaumont, Texas, contained commercial oil. He was scoffed at by practical oil men of the east, then the United States' only oil-bearing area of any importance. Noted geologists were condemnatory on the ground that such an occurrence was unprecedented. It was the rankest of rank wildcats. However, it became the "Lucas Gusher," when in January, 1901, it came in at a rate estimated as high as 125,000 barrels per day. The discovery astounded the oil men of the world, and they flocked to the new and greater mecca in droves.

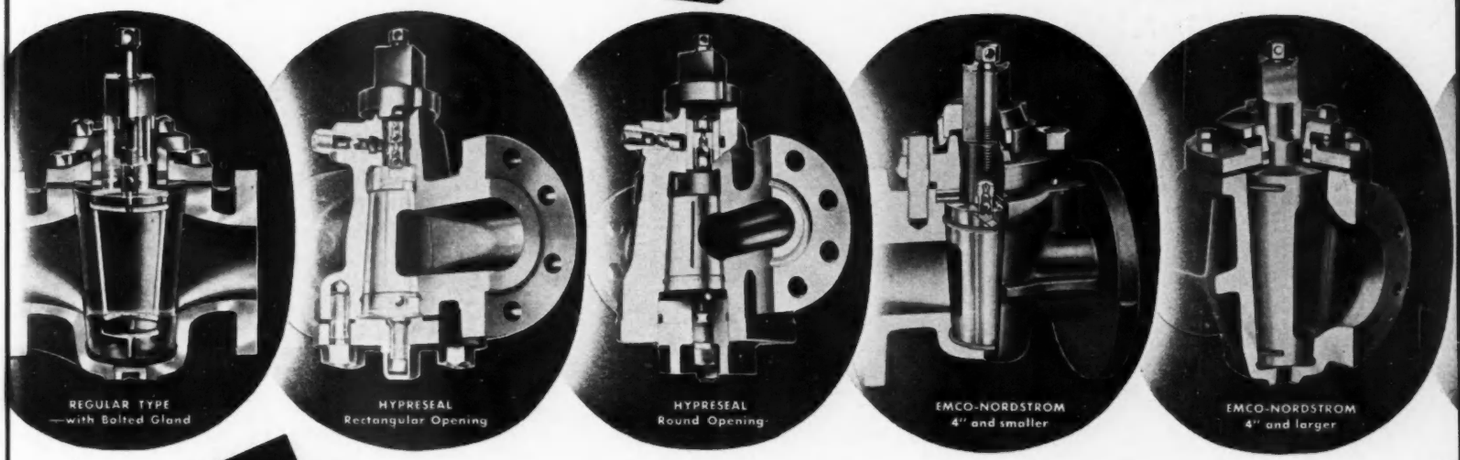
It is fitting that this man and this event be properly acknowledged by the industry, and the Lucas Gusher Monument Association has been formed for this sole purpose. The association has made no general solicitation of funds. The campaign has been conducted mostly by correspondence, and has been limited very largely to those companies and individuals who started in the oil business at Spindletop. Contributions of from $100 to $500 only are being solicited.

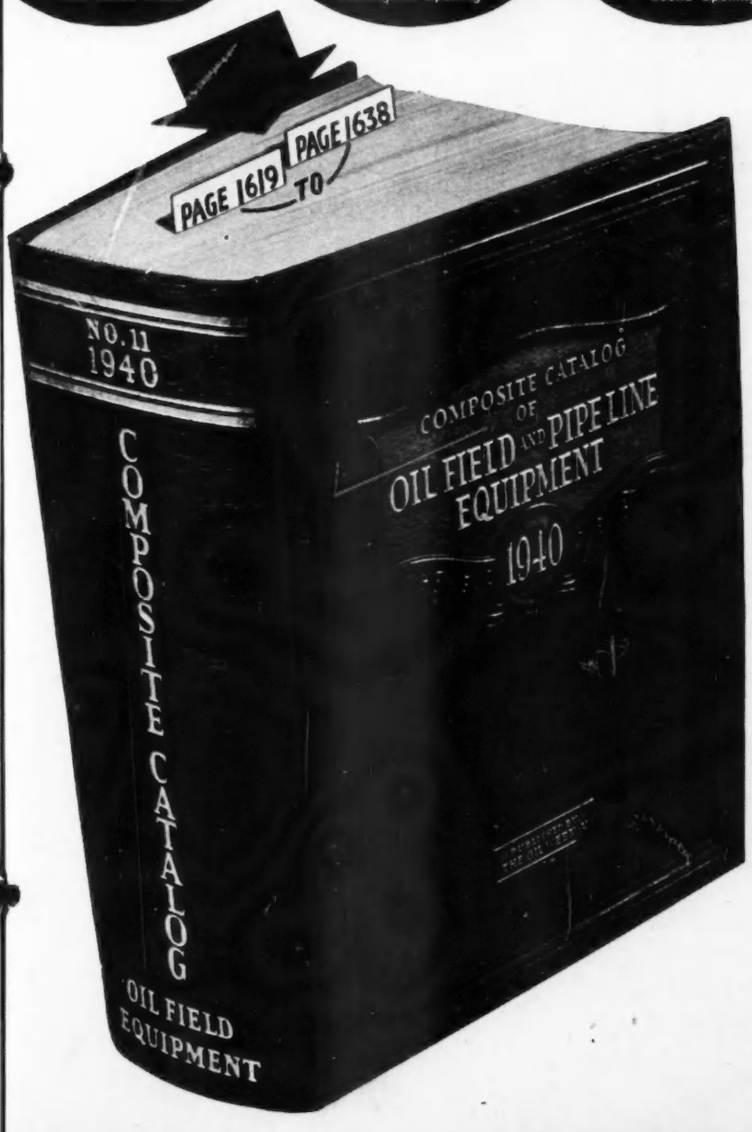
It is entirely possible that some who might wish to join in commemorating this well and man, which meant so much to the oil industry, have been overlooked. It has not been the intention of the association to slight anyone, and all oil men desirous of doing so are invited to participate. This may be done by mailing a check for from $100 to $500 to J. Cooke Wilson, president of the Lucas Gusher Monument Association, American Bank Building, Beaumont. All proceeds are to be used in erecting a fitting monument. Every effort is being made to have the monument completed by January 10, 1941, the fortieth anniversary of the discovery.

It should be recalled that a rotary rig was used to drill this well. This method was then in its infancy, having been used only in Corsicana and in some water-well drilling. The Lucas Gusher became responsible for the popularity of the rotary rig. There are today in every region of the United States, veritable powers in oil production who had their lessons on the derrick floors of Spindletop rigs subsequent to the Lucas strike. The discovery stimulated development in the many other areas, and is directly responsible for the rise of the Mid-Continent as the greatest oil-producing region known in the world. Certainly, Captain Lucas deserves a prominent and permanent place in oil history.

SEE COMPOSITE CATALOG

NORDSTROM VALVES





DRILLING AND PRODUCTION VALVES

for

GENERAL OIL FIELD SERVICE
(Semi-Steel & Carbon Steel)

GENERAL OIL FIELD SERVICE
(Round-Opening—Semi-Steel)

MUD MANIFOLDS & CEMENTING
(Malleable Iron)

PIPE LINES
(Round-Opening—Carbon-Steel)

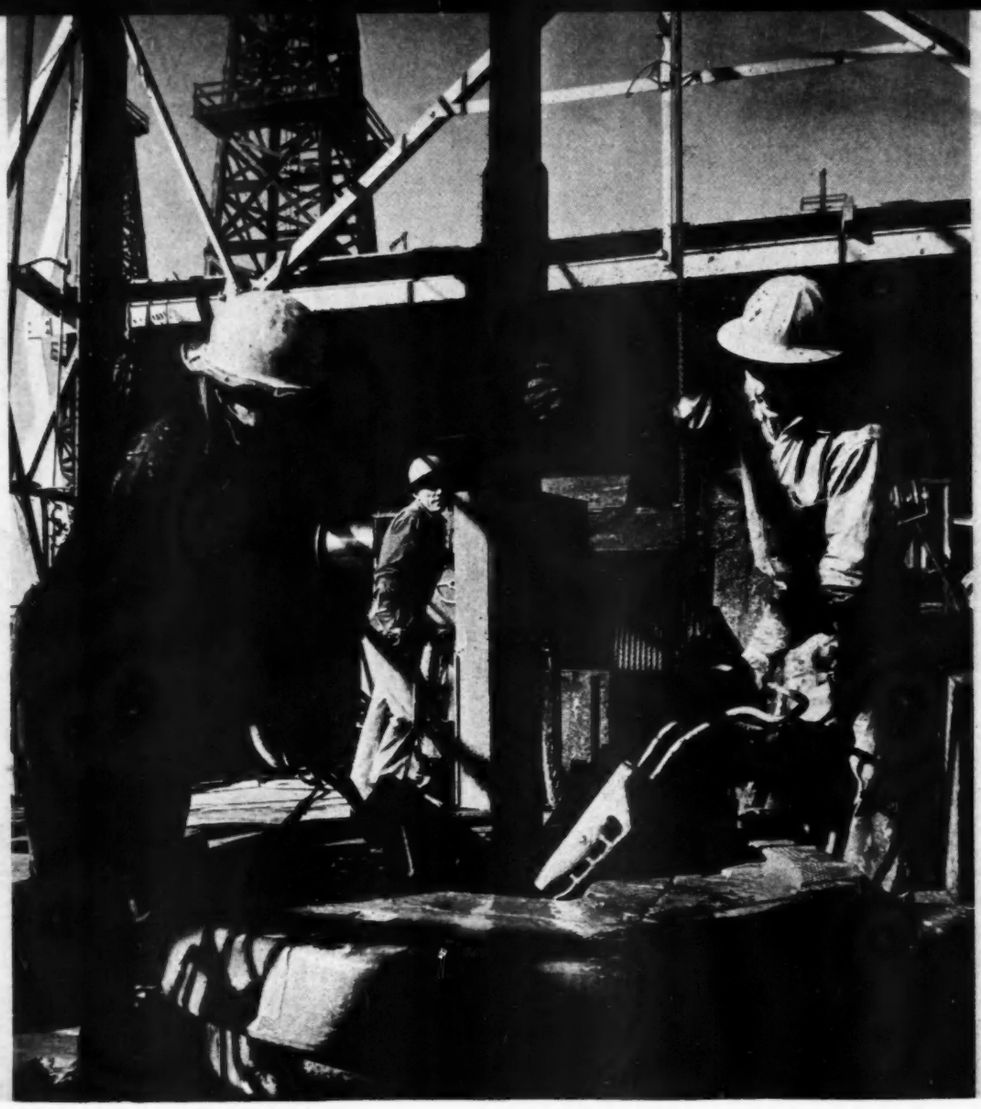
CHRISTMAS TREES
(Round & Rectangular Openings)
(Alloy Steel)

MULTIPORT CONTROL
(Carbon-Steel)

Also Gauge Cocks, Locking Devices, Etc.

MERCO NORDSTROM VALVE CO.
A Subsidiary of PITTSBURGH EQUITABLE METER CO.
WORLD'S LARGEST MANUFACTURERS OF LUBRICATED PLUG VALVES; GASOLINE, OIL AND GREASE METERS
Main Offices: 400 Lexington Ave., PITTSBURGH, PENNA.
BRANCHES: New York City, Buffalo, Philadelphia, Columbia, Memphis, Chicago, Kansas City, Des Moines, Tulsa, Houston, Los Angeles, Oakland.
CANADIAN LICENSEES: Peacock Bros., Ltd., Montreal. EUROPEAN LICENSEES: Audley Engineering Co., Ltd., Newport, Shropshire, England.
South American Representative: THE ARMCO INTERNATIONAL CORPORATION, *Main Office:* MIDDLETOWN, OHIO.

PRODUCTS: Nordstrom Plug Valves • Nordstrom Air, Curb and Meter Cocks • Nordstrom Valve Lubricants • EMCO Gas Meters • EMCO-McGaughy Integrators • EMCO Regulators • Pittsburgh Meters for Gasoline, Grease, Oil, Water and other Liquids • Raybould Couplings • Stupakoff Bottom Hole Gauges.



SLIPS DO COUNT

Good slips are vital to economical drilling and the better the grip, the better the slip. Furthermore, the lighter the slip, the less wear and tear on the floor crew. So the ideal is strength without excessive weight, a combination not always easy to get.

In at least one case the prescription is filled by making slip body sections and liner backing plates of cast Chromium-Molybdenum steel which has a good strength-weight ratio. Also, the steel develops the necessary toughness to withstand the knocking around it must take throughout its service.

The record which cast Chromium-Molybdenum Steel is making in this application matches its record in others, such, for example, as casing hooks, where combined strength and reduced weight are important. Full details regarding the various Molybdenum steels — both cast and forged — used in drilling equipment will be found in our book, "Molybdenum Steels in Oil Production", which is sent free on request to those interested in modern materials for modern needs.

PRODUCERS OF MOLYBDENUM BRIQUETTES, FERRO-MOLYBDENUM, AND CALCIUM MOLYBDATE

Climax Molybdenum Company
500 Fifth Avenue · New York City

MOLY

NOTES FOR THE Equipment Buyer and User

Control Gate

MacCLATCHIE MANUFACTURING CO.

A new combination high-pressure drilling gate and blowout preventer designed for fast and fool-proof action has been announced by MacClatchie Manufacturing Company, Compton, California.

Consisting essentially of two packing units unitized into a single housing to conserve cellar space, reduce overall height and eliminate need for extra flanges and threads, the tool packs off around both drill pipe and open hole.

There are no small gears or other working parts inside the housing that might become clogged with mud or sand. All gears are located on the outside of the unit, protected against damage by steel guards to insure proper functioning of the packers in an emergency.

MacClatchie Control Gate

Packing rubbers are available for various sizes of drill pipe and may be installed at the rig in from 1 to 1½ hours.

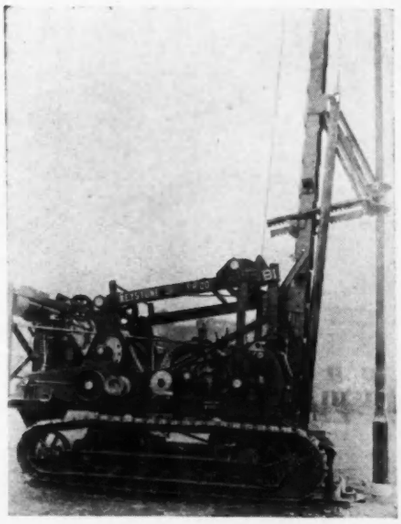
Spudder

KEYSTONE DRILLER COMPANY

A new series of deep spudders employing positive power transmission through roller chains to operating shafts mounted in anti-friction bearings has been announced by Keystone Driller Company, Beaver Falls, Pennsylvania. Model 80, a 13-ton spudder, is a skid-type machine for truck mount, while Model 81 is a 20½-ton crawler-mounted machine.

The spudder is powered with a 68-horsepower heavy-duty gasoline or Diesel engine. It has a seven-speed transmission, five forward and two reverse. With transmission in high, the line pull is 28,600 pounds, while in low a tension of 185,000 pounds is attainable.

The machine is rated for 3000 feet, handling 3000 pounds to that level and lighter tools to a greater depth. Spooling capacities are 6500 feet of ¾-inch cable on the main drum and 5300 feet of ½-inch sandline on the sand reel.



Keystone Spudder, Model 80

Of all-steel electric-welded and riveted construction, the machine is 14¼ feet long without platform, 5 feet wide over frame, and 6 feet 4½ inches high, frame only. The derrick, power-raised through roller chain from crankshaft, is 55 feet and may be telescoped to 40 feet 4 inches. Crown sheave is mounted in slide upon dual spring shock absorber.

Main drum shafting is 4-inch alloy steel, and 4-15/16-inch crankshaft is mounted in anti-friction ball-bearing pillow blocks, driven by heavy roller chain. Crown sheave is alloy cast steel, 29⅛-inch tread diameter, 33-inch ball bearing. Sandline sheave is 27-inch diameter and spudding sheaves 25-inch diameter.

Beams are of the outside type, and shafts are 5½-inch diameter. Length and speed of stroke are adjustable to give maximum drilling speed in various formations.

Engine Indicator

Bacharach Industrial Instrument Company, 7000 Bennett Street, Pittsburgh, has issued Bulletin 281, giving four pages descriptive of its Type 4-HS indicator for high-speed engines. The indicator provides diagrams on paper cards of a size described as large enough for accurate measurement without the necessity of enlargement.

Liquid Level Controllers

Cochrane Corporation, 17 Street & Allegheny Avenue, Philadelphia, has issued Publication 2939 describing five different methods of liquid-level control. Descriptions of the operation and advantages of each type are given to simplify proper selection from tabulated data that includes operating characteristics and list prices.

Vented Plug Clamp

M. B. SKINNER COMPANY

A plug clamp for high-pressure pipe lines designed so that the pressure vents while the clamp is being placed in position, followed by closing of the plug, has been announced by M. B. Skinner Company, South Bend, Indiana.

The head of the clamp consists of a malleable iron cylinder resting on a pressure-distributing base, anchored to the pipe by bolts and straps. The cylinder is fitted with a rubber-faced metal piston operated by a heavy thrust-screw gasket surface 2-3/16-inch in diameter.

The lower rim of the gasket is armored with a brass band to prevent burning in the last stages of shutting off and to prevent rubber from escaping through the vent. The bottom of the gasket is ground to fit curvature of pipe, and the piston is keyed in the cylinder to prevent rotating out of position while thrust screw is being tightened.

Skinner's Vented Plug Clamp

Tubing Head

RECTOR WELL EQUIPMENT COMPANY

A stripper-type tubing head designed for use on medium-pressure wells where operations require a tubing head within which a stripper is incorporated, designated Type MS, has been announced by Rector Well Equipment Company, Fort Worth, Texas.

The stripper is adjustable from the outside of the tubing head by means of screws, and wear on the stripper occurring by reason of tubing passing through under pressure may be compensated for by use of the screws in contact with stripper rubber. After the desired amount of tubing is run in the well, the usual completion procedure is followed. The stripper, designed to check all pressures from the annular space, is of neoprene and does not de-

CORE AND SHOT HOLE DRILLING CONTRACTORS

"For Better Cores" . . . see Failing . . . Experienced operators and improved equipment save you money on all types of exploration drilling . . . oil, sulphur, and other minerals.

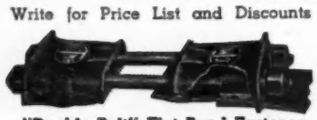
FAILING EXPLORATION & DRILLING CORPORATION
3611 CALHOUN ROAD
HOUSTON, TEXAS

Tecktonius
E C Mc

"Single Bolt" Flat Band Fastener

TECKTONIUS FASTENERS for . . . all band-joining requirements have been standard equipment in oil fields for a half century. They are TRADE MARKED for your protection.

Write for Price List and Discounts



"Double Bolt" Flat Band Fastener

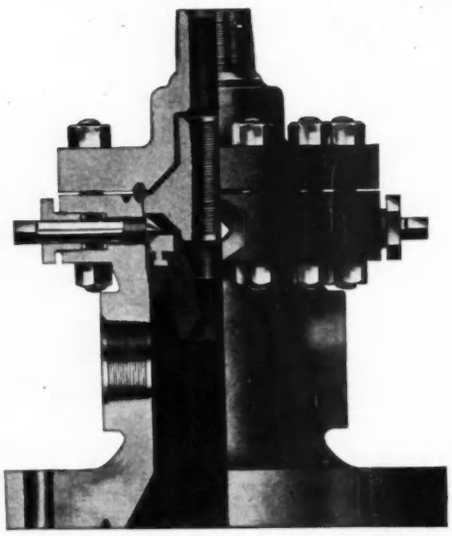
E. C. TECKTONIUS MFG. CO.
RACINE, WISCONSIN

TIN END ENVELOPES for Sand Samples

Made of strong kraft paper, tightly sealed to eliminate leaks. Top end folds over with easy twist and holds contents securely. Most economical for sending and filing of sand samples. Phone, write or wire for our low prices.

GULF ENVELOPE CO.
617 BROOKS Fx. 4171
HOUSTON, TEXAS

NOTES FOR THE Equipment Buyer and User



Rector Type MS Stripper Tubing Head

teriorate under the action of oil or gas.

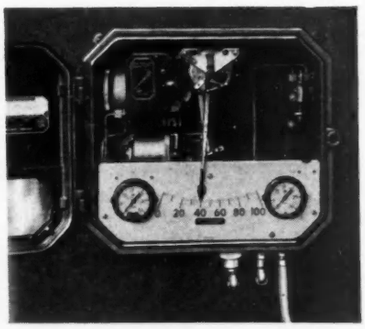
The stripper head employs a threaded mandrel support for tubing, and the support is furnished with slips if desired.

The body and top flange are cast SAE 3130 chrome-nickel steel, while the mandrel is of hammer-forged alloy steel. Side outlets are regularly furnished threaded for 3-inch API line pipe, but are available with flanged connections if desired. The head meets all API specifications as to dimensions and pressure sealing.

Remote Indicating System

TAYLOR INSTRUMENT COMPANIES

A new pneumatic system for correlating temperature, pressure, flow or liquid-level data on a centralized panel or in a control room, designated Taylor remote pneumatic transmission system, has been announced by Taylor Instrument Companies, Rochester, New York.



Taylor Indicating Transmitter

Utilizing standard Taylor instruments, the system may consist of one or two transmitters connected to a receiver, or one or more receiving instruments, not necessarily near each other, and as far as 1000 feet from the transmitter. Transmitters or receivers may be indicating, recording or controlling types. Quarter-inch copper tubing is the means of connection for the air transmitting medium.

The system is described as accurate within 1 percent of the scale range when properly installed, and speed of response of the receiver to changes in output air pressure from the transmitter is largely dependent upon distance, maximum lag said to be 1 percent per 100 feet of connecting tubing.

The system is designed to do away with electrical circuits in explosive atmospheres, and to measure, transmit and receive continuously regardless of electrical current failures. The operator out on the unit is provided with an indicating or recording instrument for observation, eliminating the necessity of returning to the main control board to check performance of the unit.

Gear Reducers

Link-Belt Company, 307 North Michigan Avenue, Chicago, has issued Catalog 1519-A describing its line of herringbone-gear reducers. Replacing Catalog 1519, it describes several new sizes and gives changes in construction that have brought about revisions in both horsepower ratings and dimensions.

CO_2 Indicator

Bacharach Industrial Instrument Company, 7000 Bennett Street, Pittsburgh, has issued Bulletin 337 describing its Fyrite CO_2 indicator. The unit is described as providing analysis in 30 seconds, as spill proof in any position and as cold-weather proof.

Wire Rope

Macwhyte Company, Kenosha, Wisconsin, has issued a 4-page bulletin describing construction of its wire rope, with emphasis on internal lubrication.

"Exploration Geophysics" Is New Volume on Prospecting

Fundamental theories, equipment and field techniques of recognized exploratory geophysical methods, together with illustrations of their application to problems of economic geology, are

Standco NO-SMOKE

STANDCO BRAKE LINING

nothing novel—no bunk—but it gets the job done without scoring brake rims. See page 2100 Composite Catalog.

Standco Brake Lining Co.
HOUSTON

NOTES FOR THE Equipment Buyer and User

covered in "Exploration Geophysics," an 800-page volume with 430 illustrations authored by Dr. J. J. Jakosky.

The volume is directed to geophysicists; geologists; petroleum, mining and civil engineers; supervisors and production men of oil and mining companies; teachers, physicists; directors of public works; patent attorneys, and prospectors. A number of examples of commercial surveys supplement practical descriptions of contemporary geophysical techniques and instruments.

Each chapter was prepared in collaboration with geophysicists with extensive experience in their particular field of work.

Copies of "Exploration Geophysics" may be obtained from the Book Department, The Gulf Publishing Company, Box 2608, Houston, at $8.00 a copy.

D & B Pump Service Store Opened at Freer, Texas

A D & B pump sales and service store has been established at 644 Tipton Street, Freer, Texas, to provide additional service to customers who purchase D & B pumps through The Continental Supply Company.

F. L. Prossor will be in charge of the store, aided by W. T. Hoey, Hebbronville, and R. K. Cannan, Alice. Jo Earl Morris will act as floorman.

Homco Cutting & Fishing Tool Service Enters California Fields

Homco Cutting and Fishing Tool Service, division of Houston Oil Field Material Company, has announced inauguration of a cutting and fishing tool service, together with a side-wall sampling service for California fields. Location has been established with Valley Warehouse Service Company, Bakersfield.

R. E. Golemon

Personnel appointed for service in California includes R. E. Golemon, district superintendent, D. U. Skinner and E. E. Millican. Golemon was transferred from Shreveport, Skinner was transferred from Houston, while Millican has been working in California fields for the past 12 years.

E. E. Millican

D. U. Skinner

Motor Improvements, Inc., Renamed Purolator Products, Inc.

The directorate and stockholders of Motor Improvements, Inc., makers of Purolator oil filters, have approved resolutions changing the company's name to Purolator Products, Inc.

The change was made to eliminate possible confusion in dissimilarity of company and product names, and does not reflect any organization change.

Stainless Steel Welding

Republic Steel Corporation, Cleveland, has issued Form ADV 373, 20 pages, entitled "The Welding of Republic Enduro Stainless Steel," illustrating and giving late data on welding of stainless steel by electric arc, atomic hydrogen, flash, projection, seam, spot and gas methods. The booklet also treats of brazing and silver soldering, and a section gives drawings demonstrating the design of welded joints for stainless steel construction.

Crane

General Excavator Company, Marion, Ohio, has issued Bulletin 4018 describing its new wheel-mounted crane. The 12 pages give information on lifting capacity, mobility, maneuverability and stability of the unit. The crane is rated for travel speeds up to 10 miles an hour, and for lifting 5000 pounds at 50-foot radius in full-circle operation. Illustrations show typical operations as a crane, clamshell, dragline, pullshovel and piledriver.

Weight Indicator

The National Supply Company, Toledo, Ohio, has issued Bulletin 277 descriptive of its 300-ton hydraulic weight indicator. The device is suspended from the traveling block to directly ascertained weight on the rotary hook or connector. It consists essentially of a cylinder attached to the traveling block and a piston attached to the hook. The pull between the cylinder and the piston is transmitted to fluid in the cylinder, and the fluid pressure is transferred through a high-pressure line to an instrument panel at the driller's position.

It's Costly to Be a HIDDEN LEAK DODGER

Truest testimonial to RECTORSEAL is its use in a pinch . . . on tough jobs where other materials fail to stop leaks or on surface jobs where its good results are so evident. But, why confine your use of RECTORSEAL to "show places" and be content to use this or that compound for the hidden leaks which may be the most costly in the end? Why not standardize on this positive leak preventer as so many operators are doing . . . at the surface, in the well, everywhere there's a threaded or gasket connection? RECTORSEAL, in the long run, is less costly than conventional dopes!

Ask for RECTORSEAL, by name, at your Supply Store

RECTORSEAL
TRADE MARK REG. U. S. PAT. OFF.
THE POSITIVE LEAK PREVENTER

OIL BOOKS

The knowledge gained through years of work and study by some of the most capable men in the oil industry is set down in the various oil books published and sold by the Gulf Publishing Company. Catalog of these books furnished upon request.

THE GULF PUBLISHING COMPANY
P. O. Box 2608 Houston, Texas

EASY, QUICK ASSEMBLY

UNIBOLT
(TRADE MARK REGISTERED U. S. PATENT OFFICE)
THE ONE BOLT COUPLING

Making up the one bolt applies equalized pressure at all points around the seal ring and effects an instant pressure-tight seal.

THORNHILL-CRAVER COMPANY, Inc.
Houston, Texas

Squeaks from the Bull Wheel

Slow Him Down

Donovan's foreman was telling him how to carry a lot of material on his small barrow. Donovan listened attentively and then asked: "You haven't a couple of ten-pound weights by any chance, have you?"

"What for?"

"To tie to my legs to stop me from breaking into a gallop."

Faux Pas

The pastor was examining one of the younger classes, and asked the question:

"Who can tell me what are the sins of omission?"

After a little silence, one young lady offered:

"Please, sir, they're sins we ought to have committed, and haven't."

Help in Reverse

"I know a chorus girl who made a millionaire out of a man she married in just a few months."

"Was he very poor when she married him?"

"No, he was a multi-millionaire."

Almost a Proposal

A young man was a frequent caller at a house where there were four daughters, but it was impossible to say which of them he preferred.

One evening the eldest sister, Agatha, happened to be the only one in the house, and consequently she had the young man to herself.

"Agatha, you look tired," he said.

"I am a little," she replied, and wondered what might be coming next.

"You see, I made an enormous batch of cakes and pies. Mother prefers my baking to the cook's. I also made a few pots of jam. Father's fond of jam. And I have done all the housework, too."

"Fine!" said the young man. Then he went on ardently: "Agatha, there is a question I want to ask you, and my life's happiness may depend on your answer."

"Well, ask away," smiled Agatha, blushing.

"If I marry one of your younger sisters, will you consent to make your home with us?"

The Other Cheek

"Have you ever wondered what you would do if you had Rockefeller's income?"

"No, but I have often wondered what he would do if he had mine."

Sacred Oath

"You know what will happen to you if you tell a lie?"

"Ah'll go to hell and burn a long time."

"And now do you know what will happen if you tell the truth?"

"We lose de case."

Price of a Touch

"Can I touch you for five dollars?"

"For five dollars you can sock me on the jaw."

How Come

Doan ferget, nigger, dat yo' married me fer better or wusser.

Dat's all right, brown baby, but how come yo-all keeps gittin' wusser 'n' wusser?

Vigilance

All the time he was eating his meal in the restaurant, Sandy kept his eyes fixed on his coat hanging on the wall.

His friend became interested. "What are you watching so carefully, Sandy?"

"Ah'm watching ma coat."

"But you needn't do that, Sandy. I'm not watching mine."

"Ye dinna have to. It went half an hour back."

Politics First

A surgeon, an architect, and a politician were arguing about the relative ages of their professions.

The surgeon related that Eve was made out of one of Adam's ribs and that implied surgery.

The architect claimed that the arrangement of matter out of chaos indicated architecture.

The politician beamed, "But it took someone to make the chaos!"

The Tough Banker

The notoriously tough banker sat back of his desk and glowered around him.

A young man approached and said: "I'd like to talk to you, if I may. I have a business proposition to present to you."

"Come in," scowled the tough banker.

The visitor walked in.

"Sit down," said the tough banker.

As he took a chair, the visitor showed definite signs of distress in his back. He explained:

"Im a little stiff from bowling."

"Sit down, little stiff," said the tough banker. "I don't care where the Hell you're from. What's your proposition."

Slips That Pass in the Type

When one considers the millions of words that are printed every day in newspapers, magazines, books, etc., it is no wonder that some slips do get by the watchful eyes of the copyreaders. Many times these typographical errors are very amusing.

When the linotypist hits the wrong key something like this is liable to happen as it did in a New York newspaper: "For sheer democratic dignity, nothing could exceed the moment when, surrounded by the Cabinet, Mr. Roosevelt took his simple *bath* as president of the United States."

Typesetters also omit letters, notably so when a Des Moines newspaper reported of Witter Bynner, the poet, that he had been the *pot* of the evening." Bynner took it graciously enough, remarking: "They probably thought it was a recital of chamber music."

Certain words are a standing peril to the typesetter. A collision between a train and a cow, reported in a newspaper, ended with the remark that the engineer "putting on full steam dashed up against the cow and literally cut it into *calves*."

An unfortunate impression was given when a newspaper, reporting a wedding with a double quartette of bridesmaids, said: "The bride was accompanied to the altar by *tight* bridesmaids."

The word, window, has harassed the editors of all English-speaking countries, but it was nevertheless astonishing to find "House & Garden" remarking: "Nothing gives a greater variety to the appearance of a house than a few undraped *widows.*"—*O'Bannon's Between Calls.*

Gott
Gotkool
WATER CANS
& COOLERS
GOTT Water Cans are the practical way to keep drinking water cool for long periods, protected from impurities and always handy to the job. Snug fitting large removable top, strongly built to withstand rough usage. GOTT Water Coolers have extra large covers and a handy non-leaking push button faucet. Your Supply Store has them, get one today!
GOTT WATER CAN
Made in
10 gallon sizes
H. P. GOTT MFG. CO.
WINFIELD, KANSAS
KEEP PURE DRINKING WATER ALWAYS HANDY

CAN YOU DO THIS?

"The Entirely Different Boiler and Engine Treatment"

HOLD A WHOLE MONTH'S SUPPLY OF UNFAILING BOILER SCALE AND CORROSION REMOVAL AND PREVENTION IN THE PALM OF YOUR HAND?

That's how simple it is with

SAND-BANUM

Only ounces applied once each week insure equipment free from scale and corrosion.

Write today for details of our "Satisfaction or No Money" guarantee trial offer.

AMERICAN SAND-BANUM CO., Inc.

9 Rockefeller Plaza — New York City

WESTERN SAND-BANUM CO.

Houston, Texas — Fresno, Calif.

Export Representative, PETROLEUM MACHINERY CORP.

30 Rockefeller Plaza — New York City

GAS-LIFT PRINCIPLES AND PRACTICES

By S. F. SHAW, E.M.
Consulting Engineer

THIS BOOK is largely based on a series of lectures on gas lift delivered before the Petroleum Engineering Department of the Agricultural and Mechanical College of Texas on November 9th and 10th, 1939, by the author as special lecturer of the Department of Petroleum Engineering.

A history of the development of the air-gas lift is given, covering operations in air and gas-lift, and noting some of the inventions that have been patented in connection with this work.

The performance data in the numerous tables are selected from some 15 000 actual field tests made to determine the best rates at which to produce a well, these tests being made by the author or under his supervision, in many fields of the United States and foreign countries.

The principles controlling operation of the gas-lift are discussed, curves and formulas are given for determining the quantity of gas required to lift liquids, and curves and formulas are given for determining the capacity of various sizes of pipes in certain fields, and methods are discussed for determining similar formulas and curves in new oil fields.

A lengthy discussion of the selection of compressors and building of plants suitable for handling gas-lift operations is given.

CONTENTS:

History and Invention; General Principles Controlling Gas-Lift Operations; Lifting Efficiency; Lift and Submergence; Pressure; The Eductor; Straight or Continuous Gas-Lift; Combination Gas-Lift Flow; Intermittent Gas-Lift Flow; Compressor Plant Installations; Gas-Lift Practices in Various Fields.

Size 5¾ x 8¼ — 156 Pages — Fabrikoid Binding
Price $3.00, Postage Paid

Send check to the

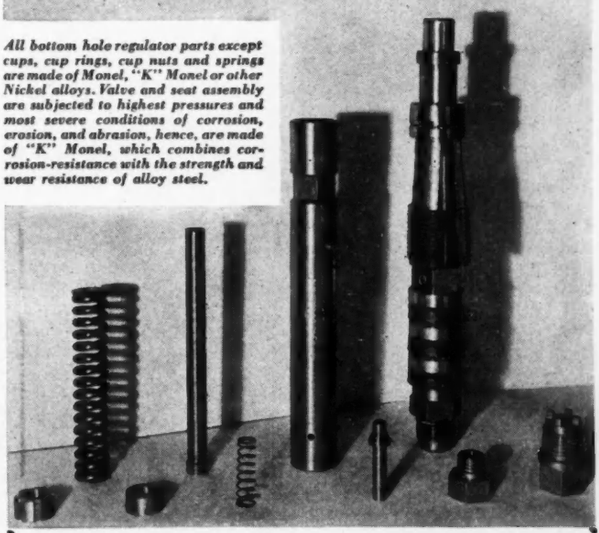
GULF PUBLISHING CO.

P. O. BOX 2608, HOUSTON, TEXAS

STANDS OFF HARD PUNISHMENT 8000 Ft. Below Ground...

First step in lowering Otis bottom hole regulator into a well.

All bottom hole regulator parts except cups, cup rings, cup nuts and springs are made of Monel, "K" Monel or other Nickel alloys. Valve and seat assembly are subjected to highest pressures and most severe conditions of corrosion, erosion, and abrasion, hence, are made of "K" Monel, which combines corrosion-resistance with the strength and wear resistance of alloy steel.



Control mechanism parts made of Nickel-base alloys withstand severe corrosion and abrasion

Deep well pressures up to several thousand p.s.i. cause high velocity flow of oil and gas through control devices. This condition alone produces severe erosion and abrasion of metal parts. Even more severe however is abrasion by sand and other solids ... which are "fired" at metal parts with cannon-like force.

But Otis Pressure Control, Inc. of Dallas, Texas, have found how to keep down wear and boost the life of equipment. After careful scrutiny of various materials, they have standardized on Monel*, "K" Monel* and other Nickel-base alloys for vital parts.

Because these metals are strong and tough, also highly resistant to wear and corrosion, they prove exceptionally long-lived. Full information mailed on request. Address:

THE INTERNATIONAL NICKEL COMPANY, INC., 67 Wall St., New York, N.Y.

*"Monel" and other trade-marks which have an asterisk associated with them are trade-marks of The International Nickel Company, Inc.

MONEL

The Same Old R·P·Ms But

LARGER SPROCKETS	*PLUS*	MORSE *Silent* CHAIN
EQUALS MILE A MINUTE CHAIN SPEEDS	*AND*	GREATLY INCREASED POWER TRANSMITTING CAPACITY

IT IS A simple matter with Morse Chain! Simply by using larger sprockets with more teeth, jumping chain speeds up to mile-a-minute, Morse Chain's power transmitting capacity is multiplied.

This treatment results in slip and wasted power in other types of drives, but not in Morse Chain drives. The silent chain actually utilizes centrifugal force to produce better contact with sprocket teeth, and more even load distribution.

Morse Silent Chain, operating at mile-a-minute speeds, is so silent you scarcely hear it. There's no noise of strain or overloaded bearings. Load capacity rises tremendously with chain velocity. Wear is at a bare minimum, because the load is distributed over multiple chain and sprocket teeth. Chain width greatly reduced. Efficiency is 99.4% for the life of the drive with high velocity silent chain.

Morse High Speed Silent Chain drives can probably work profitably for you. Applicable to speeds from 400 to 4000 r.p.m. Ask the Morse man in your territory for full information. Or write Morse, Ithaca.

HOUSTON OFFICE: 1418 POLK AVENUE, HOUSTON, TEXAS

SILENT CHAINS ROLLER CHAINS FLEXIBLE COUPLINGS KELPO CLUTCHES

MORSE *positive* DRIVES

MORSE CHAIN COMPANY ITHACA N. Y. DIVISION BORG-WARNER CORP.

Complete Control

THE "MAN ON THE BRIDGE" HAS COMPLETE CONTROL OF HIS SHIP
... UPON HIS JUDGEMENT RESTS THE SAFETY OF HIS PASSENGERS

Type "OWS"
Available in
Popular Sizes
3¾" and larger

"Complete Control" of the production of Hughes Rock Bits has always been maintained by Hughes Tool Company.

From Raw Material to the finished product:—from the original design to final inspection—every Hughes Rock Bit is built for a specific purpose—and must meet the rigid performance demands Hughes Tool Company.

HUGHES TOOL COMPANY HOUSTON TEXAS

INDEX TO ADVERTISERS

*** Indicates that detailed information on the manufacturer's products or services may be found in the 1940 edition of the Composite Catalog of Oil Field & Pipe Line Equipment.**

A — Page

*Abercrombie Pump Co. — —
*Acme Fishing Tool Co. — —
*Advanced Petroleum Equipment Corp. — —
Air Reduction Sales Co. — —
*Ajax Iron Works — —
*Alten's Foundry & Machine Works — —
*Aluminum Company of America — —
Aluminum Ore Co. — 73
American Assn. of Petroleum Geologists — 98
*American Cable Division of American Chain & Cable Co. — —
American Cast Iron Pipe Co. — —
*American Hammered Piston Ring Division of Koppers Co. — —
*American Iron & Machine Works Co. — —
*American Meter Co. — —
*American Sand-Banum Co. — 105
*American Steel & Wire Co. — —
Atlas Drop Forge Co. — —
Atlas Supply Co. — —
*Axelson Manufacturing Co. — —

B

*Baash-Ross Tool Co. — 5
*Baker Oil Tools, Inc. — 3
Baldwin De La Vergne Sales Corp. — —
*Baldwin-Duckworth Division of Chain Belt Co. — —
*Barold Sales Division — —
William M. Barret, Inc. — 96
*The Barrett Co. — —
*Bartlett-Hayward Division of Koppers Co. — —
*Bethlehem Steel Co. — —
*Bethlehem Supply Co. — 7
*Braden Steel Corp. — —
*The Brewster Co. — —
The Bridgeport Machine Co. — —
*Broderick & Bascom Rope Co. — —
*Brown Oil Tools, Inc. — —
*The Buckeye Traction Ditcher Co. — —
Bucyrus-Erie Co. — 82
*The Buda Co. — —
*Butler Manufacturing Co. — —
A. M. Byers Co. — —
*Byron Jackson Co. — —

C

Jo H. Cable — —
*Cameron Iron Works — —
*Cardwell Manufacturing Co. — —
Carnegie-Illinois Steel Corp. — —
*J. I. Case Co. — —
*Caterpillar Tractor Co. — —
*The Cavins Co. — —
*Chain Belt Co. — 65
*Clark Bros. Co. — —
*Climax Molybdenum Co. — 100
*Coffing Hoist Co. — —
Columbian Steel Tank Co. — —
*Continental Motors Corp. — —
Continental Oil Co. — —
The Continental Supply Co. — —
*Fred E. Cooper Co. — 49
*The Cooper-Bessemer Corp. — —
*Core Laboratories, Inc. — —
*Crane Co. — —
W. H. Curtin Co. — —

D

*Darling Valve & Manufacturing Co. — 6
*Diamond Chain & Manufacturing Co. — 53
*Dixon Valve and Coupling Co. — —
*Dowell Incorporated — —
*The Dragon Manufacturing Co. — —
*E. I. du Pont de Nemours & Co. — 67

E

*Eastman Oil Well Survey Co. — —
Economy Electric Lantern Co. — —
Elastic Stop Nut Corp. — —
*Engineering Laboratories, Inc. — —

F

Failing Exploration & Drilling Co. — 102
First National Bank in Houston — 85
First National Bank & Trust Co. of Tulsa — —
Fluid Packed Pump Co. — —
Ford Motor Co. — 79
The Fort Worth Clearing House Association — —
The Fort Worth Laboratories — 96
Fort Worth Steel & Machinery Co. — —
*The Foster Cathead Co. — 58
*Franks Mfg. Corp. — —
Frick-Reid Supply Corp. — —

G

*Gardner-Denver Co. — —
*The Garlock Packing Co. — —
*Gaso Pump & Burner Manufacturing Co. — —
*Gatke Corp. — —
*General Electric Co. — —
General Geophysical Co. — —
General Motors Sales Corp. — 61
Geophysical Service, Inc. — —
*Globe Oil Tools Co. — —
*Goodyear Tire & Rubber Co. — —
*H. P. Gott Manufacturing Co. — 104
*Gray Tool Co. — —
*Green Head Bit & Supply Co. — —
*The Guiberson Corp. — —
Gulf Coast Laboratories — 96
Gulf Envelope Co. — 102
Gulf Oil Corp. — —
Gulf Publishing Co. — 47
Gunter Hotel — 86

H

*Halliburton Oil Well Cementing Co. — —
Hardway & Cathey — 96
C. J. Harter, Machinery — —
*Haynes Stellite Co. — —
*Hazard Wire Rope Division of American Chain & Cable Co. — —
Heldie's Machine Works — —
The Hercules Powder Co. — —
Hercules Supply Co. — 33
*Hewitt Rubber Corp. — —
Hilton Hotel — —
Hoard Exploration Co. — —
*Hobbs Manufacturing Co. — —
Hollywood Plaza Hotel — —
Houston Laboratories — 96
Houston Pipe Appliances Co. — —
*Hughes Tool Co. — Fourth Cover
Humble Oil & Refining Co. — —
*Hunt Tool Co. — —
Hyatt Bearings Division — 61

I

Independent Exploration Co. — —
*Ingersoll-Rand Co. — 39
*International Harvester Co. — —
*The International Nickel Co. — 105

J

Jarecki Manufacturing Co. — —
*Jenson Brothers Manufacturing Co. — —
*Johns-Manville — 80
*M. O. Johnston Oil Field Service Corp. — —
*Jones & Laughlin Steel Corp. — —

K

*Kerotest Manufacturing Co. — —
*Keuffel and Esser Co. — —
*Kibele Manufacturing Co. — —
Kirkeby Hotels — 96
*Kinzbach Tool Co. — —
*Koppers Co. — —

L

Landis Machine Co. — —
*Lane-Wells Co. — —
*Larkin Packer Co. — —
The Thomas Laughlin Co. — —
*The Layne & Bowler Co. — —
Lebanon Steel Foundry — 4
*Le Roi Co. — 52
*A. Leschen & Sons Rope Co. — —
*The Lincoln Electric Co. — —
*Link Belt Co. — —
Lone Star Cement Corp. — Second Cover
*Lucey Boiler & Manufacturing Co. — —
*Lucey Export Corporation — —
*The Ludlow Valve Manufacturing Co. — —
*Lufkin Foundry & Machine Co. — —

M

*MacClatchie Manufacturing Co. — —
Macwhyte Co. — —
*Maintenance Engineering Corp. — 98
P. R. Mallory & Co., Inc. — —
The Marley Co. — —
Marmon-Herrington Co. — 83
*John N. Martin, Manufacturer — —
McCollum Exploration Co. — —
*McEvoy Co. — —
McKissick Products Corp. — —
*Merco Nordstrom Valve Co. — 99
*Merla Tool Corp. — —
Merry Bros. & Perini, Inc. — 96
*Metric Metal Works — —
*Midco Bailer Co. — —
*Miller Sand Pump Co. — —
*Minneapolis-Moline Power Implements Co. — 89
*Mission Manufacturing Co. — 10
*Morse Chain Co. — Third Cover
Mott-Smith Corp. — —
Mudrite Chemicals, Inc. — —
Murray Rubber Co. — —

N

National Bank of Tulsa — —
*National Lead Co. — —
The National Supply Co. — 30-31
National Tube Co. — —
Norvell-Wilder Supply Co. — —
*Novo Engine Co. — —

O — Page

*Oil Center Tool Co. — —
*Oil City Brass Works — —
Oil Well Supply Co. — 43
*Otis Pressure Control, Inc. — —

P

*The Parkersburg Rig & Reel Co. — 81
*Patterson-Ballagh Corp. — 89
*Pelican Well Tool & Supply Co. — 88
Petroleum Electric Power Assn. — 76
Petroleum Rectifying Co. of California — —
*Pittsburgh Equitable Meter Co. — 99
*Pittsburgh Steel Co. — —
Plymouth Cordage Co. — 84

R

Reading-Pratt & Cady Division of American Chain & Cable Co. — —
*Rector Well Equipment Co. — 103
*Reda Pump Co. — —
*Reed Roller Bit Co. — 62
*Regan Forge & Engineering Co. — —
*Republic Steel Corp. — —
*The Rex Co. — —
*The Ridge Tool Co. — —
John A. Roebling's Sons Co. — —
Roosevelt Hotel — 94

S

Safety Gas Main Stopper Co. — —
Jack A. Schley — 96
*Schlumberger Well Surveying Corp. — —
The Second National Bank of Houston — —
*Security Engineering Co. — —
Seismic Exploration Co. — —
Seismograph Service Corp. — —
Shell Oil Co., Inc. — —
Shilstone Testing Laboratory, Inc. — 96
*SKF Industries, Inc. — 56
A. O. Smith Corp. — —
*E. M. Smith Co. — —
*South Chester Tube Co. — —
Southern Engine & Pump Co. — —
Southern Pacific Lines — —
Southwestern Gas & Electric Co. — 37
Spang Chalfant, Inc. — —
*Spang & Company — —
*Sperry-Sun Well Surveying Co. — —
Standard Supply and Hardware Co. — —
*Standco Brake Lining Co. — 102
*Star Drilling Machine Co. — —
Straus-Bodenheimer Co. — —

T

E. C. Tecktonius Manufacturing Co. — 102
*Templeton, Kenly & Co. — —
Texaco Development Corp. — 75
The Texas Co. — —
Texas Electric Steel Casting Co. — —
The Thermoid Co. — —
Thompson Tool Co. — —
*Thornhill-Craver Co. — 103
*The Timken Roller Bearing Co. — 29
Edgar Tobin Aerial Surveys — —
*Tretolite Co. — First Cover
Trinity Portland Cement Co. — —
Tulsa Shock Absorber Co. — —
*Twin Disc Clutch Co. — —

U

*Union Wire Rope Corp. — —
*Union Carbide & Carbon Corp. — —
*Unit Rig and Equipment Co. — —
United Gas Pipe Line Co. — 35
*United States Rubber Co. — —
United States Steel Corp. — 41 and 43
*Universal Atlas Cement Co. — 41

V

*Vickers, Inc. — —

W

Warner & Swasey Co. — —
*Waukesha Motor Co. — 57
*Well Machinery & Supply Co. — —
Well Surveys, Inc. — —
Western Electric Co. — —
*Westinghouse Electric & Manufacturing Co. — 45
*Wheeling Machine Products Co. — —
*The Wheland Co. — —
Wichita Engineering Co. — —
*Wickwire Spencer Steel Co. — —
*J. H. Williams & Co. — —
*Wilson Manufacturing Co. — 51 and 54-55
*Wilson Supply Co. — —
Witte Engine Works — —
*Worthington Pump & Machinery Corp. — —
Wyatt Metal & Boiler Works — —

Y

Youngstown Sheet & Tube Co. — 8